POWERLINK™

# POWERLINK OUTDOOR CPE

## WLAN Outdoor CPE 802.11b/g/n
## For 2.4GHz

## Part#:PL-CPE22N

## User Manual

# Before Start to Configure

The WLAN Broadband Router is delivered with the following factory default parameters on the Ethernet LAN interfaces.

Default IP Address: **192.168.1.254**
Default IP subnet mask: **255.255.255.0**
WEB login User Name: <empty> WEB login Password: <empty>

The device has three operation modes (Gateway/Bridge/WISP). The default IP addresses for the device are 192.168.1.254, so you need to make sure the IP address of your PC is in the same subnet as the device, such as 192.168.1.X.

It will take about 55 seconds to complete the boot up sequence after power on.

# Prepare your PC to configure the WLAN Broadband Router

### For OS of Microsoft Windows 95/ 98/ Me:

1. Click the ***Start*** button and select ***Settings***, then click ***Control Panel***. The ***Control Panel*** window will appear.
   **Note:** Windows Me users may not see the Network control panel. If so, *select* **View all Control Panel options** on the left side of the window
2. Move mouse and double-click the right button on ***Network*** icon. The ***Network*** window will appear.
3. Check the installed list of ***Network Components***. If TCP/IP is not installed, click the ***Add*** button to install it; otherwise go to step 6.
4. Select ***Protocol*** in the ***Network Component Type*** dialog box and click ***Add*** button.
5. Select ***TCP/IP*** in ***Microsoft*** of ***Select Network Protocol*** dialog box then click OK button to install the TCP/IP protocol, it may need the Microsoft Windows CD to complete the installation. Close and go back to ***Network*** dialog box after the TCP/IP installation.
6. Select ***TCP/IP*** and click the ***properties*** button on the ***Network*** dialog box.
7. Select ***Specify an IP address*** and type in values as following example.
   - IP Address: **192.168.1.1**, any IP address within 192.168.1.1 to 192.168.1.253 is good to connect the Wireless LAN Access Point.
   - IP Subnet Mask: **255.255.255.0**
8. Click OK and reboot your PC after completes the IP parameters setting.

### For OS of Microsoft Windows 2000, XP:

1. Click the ***Start*** button and select ***Settings***, then click ***Control Panel***. The ***Control Panel*** window will appear.
2. Move mouse and double-click the right button on ***Network and Dial-up Connections*** icon. Move mouse and double-click the ***Local Area Connection*** icon. The ***Local Area Connection*** window will appear. Click ***Properties*** button in the ***Local Area Connection*** window.
3. Check the installed list of ***Network Components***. If TCP/IP is not installed, click the ***Add*** button to install it; otherwise go to step 6.
4. Select ***Protocol*** in the ***Network Component Type*** dialog box and click ***Add*** button.
5. Select ***TCP/IP*** in ***Microsoft*** of ***Select Network Protocol*** dialog box then click OK button to install the TCP/IP protocol, it may need the Microsoft Windows CD to complete the installation. Close and go back to ***Network*** dialog box after the TCP/IP installation.
6. Select ***TCP/IP*** and click the ***properties*** button on the ***Network*** dialog box.
7. Select ***Specify an IP address*** and type in values as following example.
   - IP Address: **192.168.1.1**, any IP address within 192.168.1.1 to 192.168.1.253 is good to connect the Wireless LAN Access Point.
   - IP Subnet Mask: **255.255.255.0**
8. Click OK to completes the IP parameters setting.

For OS of Microsoft Windows NT:

1. Click the ***Start*** button and select ***Settings***, then click ***Control Panel***. The ***Control Panel*** window will appear.
2. Move mouse and double-click the right button on ***Network*** icon. The ***Network*** window will appear. Click ***Protocol*** tab from the ***Network*** window.
3. Check the installed list of ***Network Protocol*** window. If TCP/IP is not installed, click the ***Add*** button to install it; otherwise go to step 6.
4. Select ***Protocol*** in the ***Network Component Type*** dialog box and click ***Add*** button.
5. Select ***TCP/IP*** in ***Microsoft*** of ***Select Network Protocol*** dialog box then click OK button to install the TCP/IP protocol, it may need the Microsoft Windows CD to complete the installation. Close and go back to ***Network*** dialog box after the TCP/IP installation.
6. Select ***TCP/IP*** and click the ***properties*** button on the ***Network*** dialog box.
7. Select ***Specify an IP address*** and type in values as following example.
   - IP Address: **192.168.1.1**, any IP address within 192.168.1.1 to 192.168.1.253 is good to connect the Wireless LAN Access Point.
   - IP Subnet Mask: **255.255.255.0**
8. Click OK to complete the IP parameters setting.

**For OS of Microsoft Windows Vista and Windows 7**

1. Click ***Start*** Button and select ***Control Panel***, the ***Control Panel*** windows pop up.
2. From ***Network and Internet*** category choose ***View network status and tasks***.
3. Select ***Change adapter settings***, right click ***Local Area Connection***, select ***Properties***
4. From popup menu in ***Networking*** tab select ***Internet Protocol Version 4 (TCP/IPv4)*** then click ***Properties***.
5. Check ***Use the following IP address*** then Specify IP address as following example.
   - Enter your IP Address; the IP Address can be any number within the range from **192.168.1.1** to **192.168.1.253**.
   - IP Subnet Mask: **255.255.255.0**

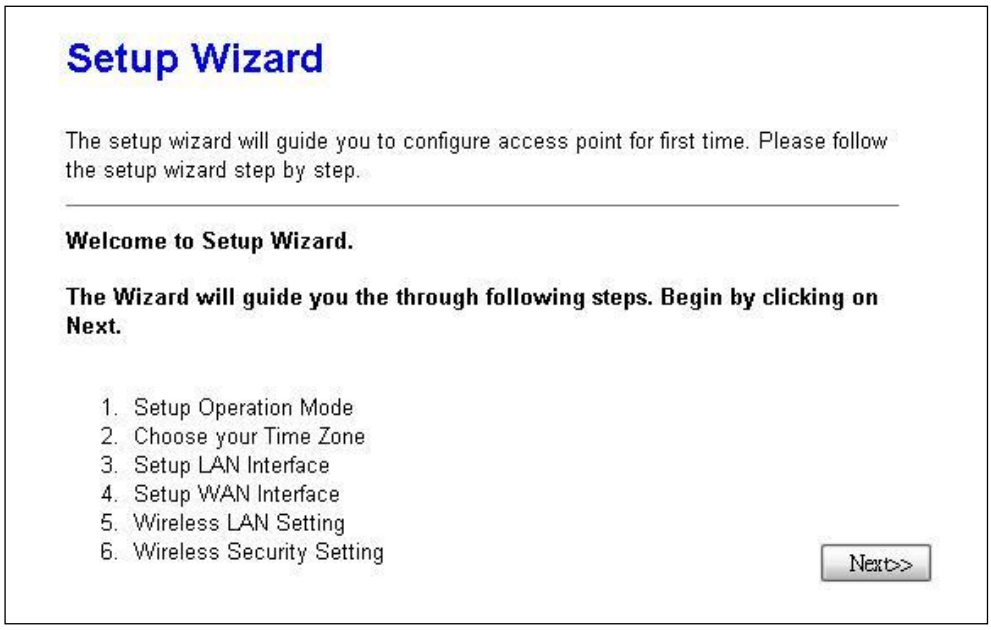
Click OK to complete the IP parameters setting.

This page shows the current status and some basic settings of the device, includes system, wireless, Ethernet LAN and WAN configuration information.

| Item | Description |
|---|---|
| Uptime | It shows the duration since WLAN Broad |
| Firmware version | It shows the firmware version of WLAN Broadband Router. |
| **Wireless Configuration** | |
| Mode | It shows wireless operation mode |
| Band | It shows wireless operation mode |
| SSID | It shows the SSID of this WLAN Broadband Router. The SSID is the unique name of WLAN Broadband Router and shared among its service area, so all devices attempts to join the same wireless network can identify it. |
| Channel Number | It shows the wireless channel connected currently. |
| Encryption | It shows the status of encryption function. |
| BSSID | It shows the BSSID address of the WLAN Broadband Router. BSSID is a six-byte address. |
| Associated Clients | It shows the number of connected clients (or stations, PCs). |
| **TCP/IP configuration** | |
| Attain IP Protocol | It shows type of connection. |
| IP Address | It shows the IP address of LAN interfaces of WLAN Broadband Router. |
| Subnet Mask | It shows the IP subnet mask of LAN interfaces of WLAN Broadband Router. |
| Default Gateway | It shows the default gateway setting for LAN interfaces outgoing data packets. |
| DHCP Server | It shows the DHCP server is enabled or not. |
| MAC Address | It shows the MAC address of LAN interfaces of WLAN Broadband Router. |
| **WAN configuration** | |
| Attain IP Protocol | It shows how the WLAN Broadband Router gets the IP address. The IP address can be set manually to a fixed one or set dynamically by DHCP server or attain IP by PPPoE / PPTP connection. |
| IP Address | It shows the IP address of WAN interface of WLAN Broadband Router. |
| Subnet Mask | It shows the IP subnet mask of WAN interface of WLAN Broadband Router. |
| Default Gateway | It shows the default gateway setting for WAN interface outgoing data packets. |
| DNS1/DNS2/DNS3 | It shows the DNS server information. |
| MAC Address | It shows the MAC address of WAN interface of WLAN Broadband Router. |

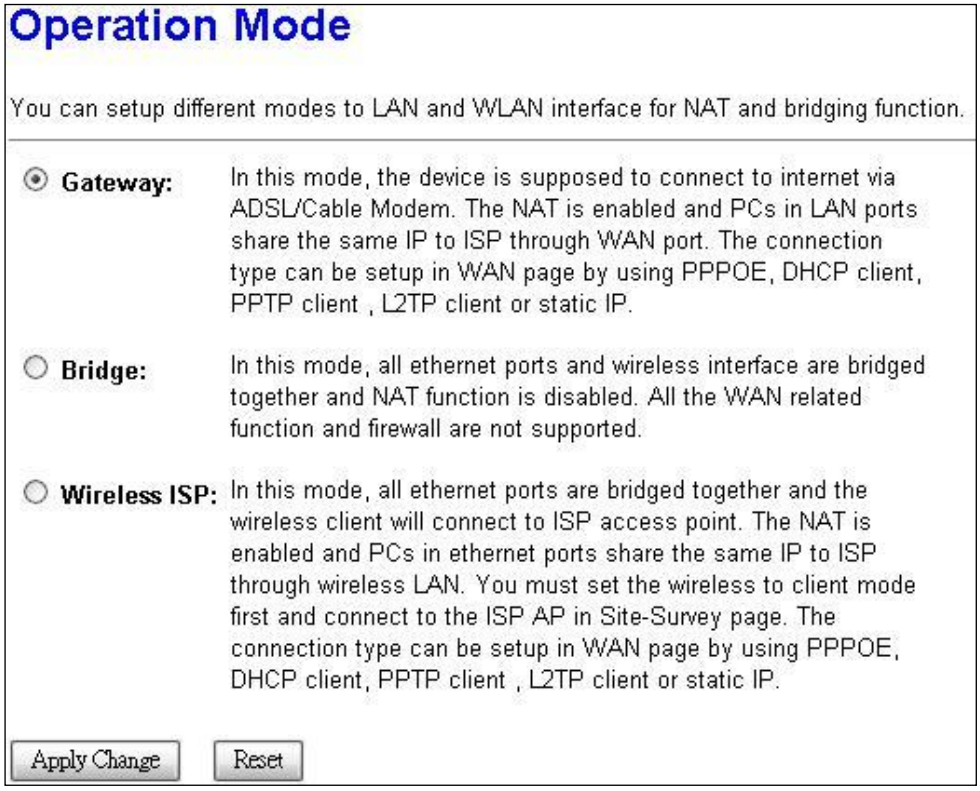
## Setup Wizard

This page guides you to configure wireless broadband router for first time


Setup Wizard
The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.
Welcome to Setup Wizard.
The Wizard will guide you the through following steps. Begin by clicking on Next.
1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Interface
5. Wireless LAN Setting
6. Wireless Security Setting
Next>>

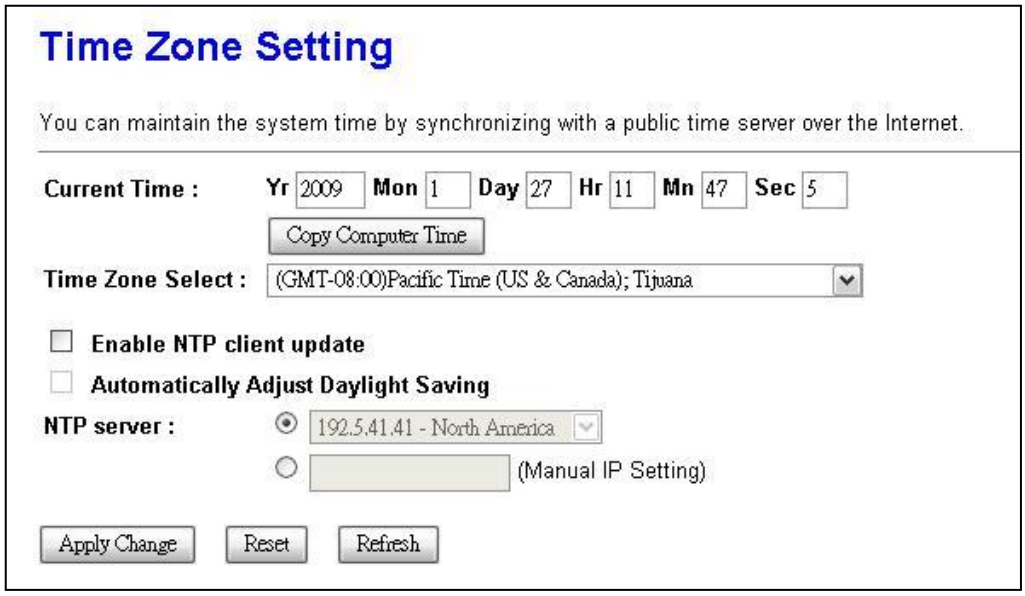
## Operation Mode

This page followed by Setup Wizard page to define the operation mode.


Operation Mode
You can setup different modes to LAN and WLAN interface for NAT and bridging function.
Gateway: In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in LAN ports share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client , L2TP client or static IP.
Bridge: In this mode, all ethernet ports and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.
Wireless ISP: In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client , L2TP client or static IP.
Apply Change
Reset

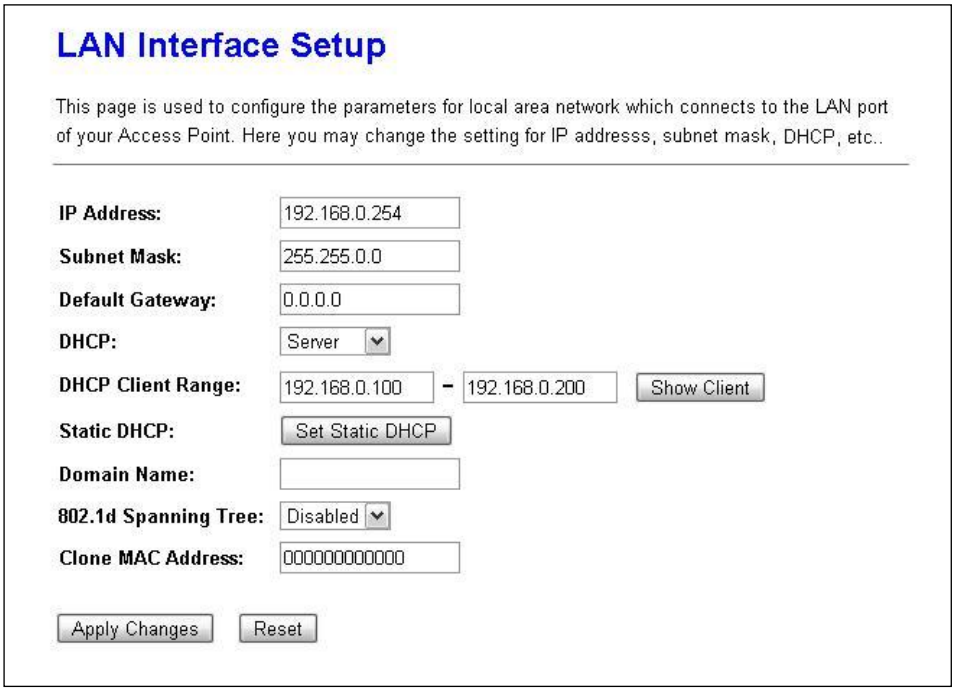
## Time Zone Setting

This page is used to enable and configure NTP client


Time Zone Setting
You can maintain the system time by synchronizing with a public time server over the Internet.
Current Time :
Yr 2009 Mon 1 Day 27 Hr 11 Mn 47 Sec 5
Copy Computer Time
Time Zone Select :
(GMT-08:00)Pacific Time (US & Canada); Tijuana
Enable NTP client update
Automatically Adjust Daylight Saving
NTP server :
192.5.41.41 - North America
(Manual IP Setting)
Apply Change
Reset
Refresh

## LAN Interface Setup

This page is used to configure local area network IP address and subnet mask

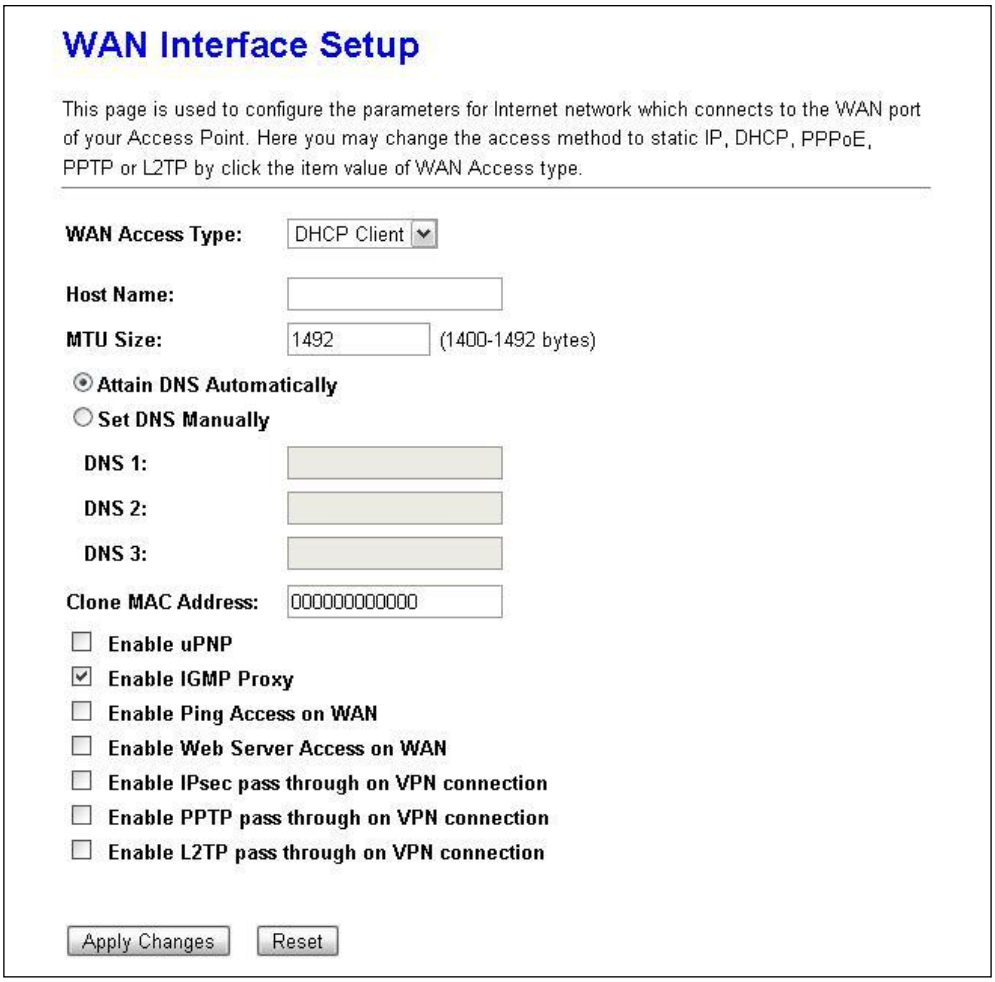



| Item | Description |
|---|---|
| IP Address | Fill in the address of LAN interfaces of this WLAN Access Point. |
| Subnet Mask | Fill in the subnet mask of LAN interfaces of this WLAN Access Point. |
| Default Gateway | Fill in the default gateway for LAN interfaces out going data packets. |
| DHCP | Click to select Disabled, Client or Server in different operation mode of wireless Access Point. |
| DHCP Client Range | Fill in the start IP address and end IP address to allocate a range of IP addresses; client with DHCP function set will be |

| | |
|---|---|
| | assigned an IP address from the range. |
| Show Client | Click to open the active DHCP Client Table window that shows the active clients with their assigned IP address, MAC address and time expired information.[Server mode only] |
| Static DHCP | Select enable or disable the Static DHCP function from pull-down menu[Server mode only] |
| Set Static DHCP | Manual setup Static DHCP IP address for specific MAC address.[Server mode only] |
| Domain Name | Assign Domain Name and dispatch to DHCP clients. It is optional field. |
| 802.1d Spanning Tree | Select enable or disable the IEEE 802.1d Spanning Tree function from pull-down menu. |
| Clone MAC Address | Fill in the MAC address that is the MAC address to be cloned |
| Apply Changes | Click the Apply Changes button to complete the new configuration setting |
| Reset | Click the reset button to abort change and recover the previous configuration setting. |

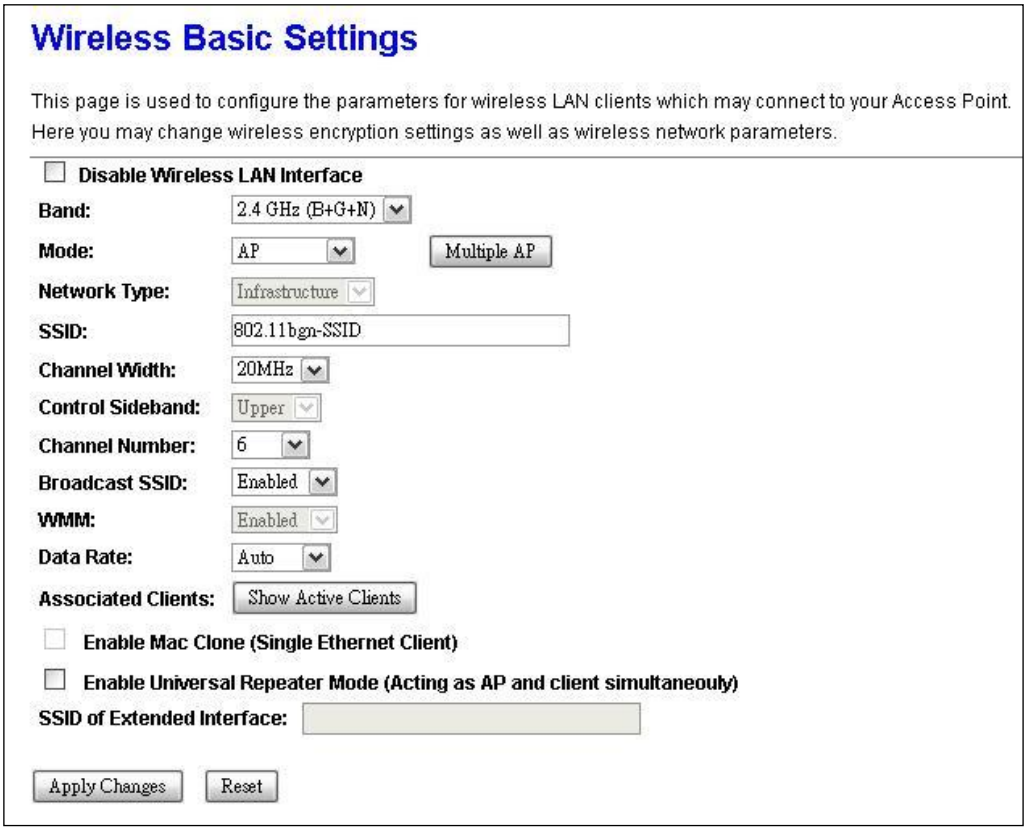
# WAN Interface Setup

This page is used to configure WAN access type


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.
WAN Access Type:
DHCP Client
Host Name:
MTU Size:
1492
(1400-1492 bytes)
Attain DNS Automatically
Set DNS Manually
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address:
000000000000
Enable uPNP
Enable IGMP Proxy
Enable Ping Access on WAN
Enable Web Server Access on WAN
Enable IPsec pass through on VPN connection
Enable PPTP pass through on VPN connection
Enable L2TP pass through on VPN connection
Apply Changes
Reset

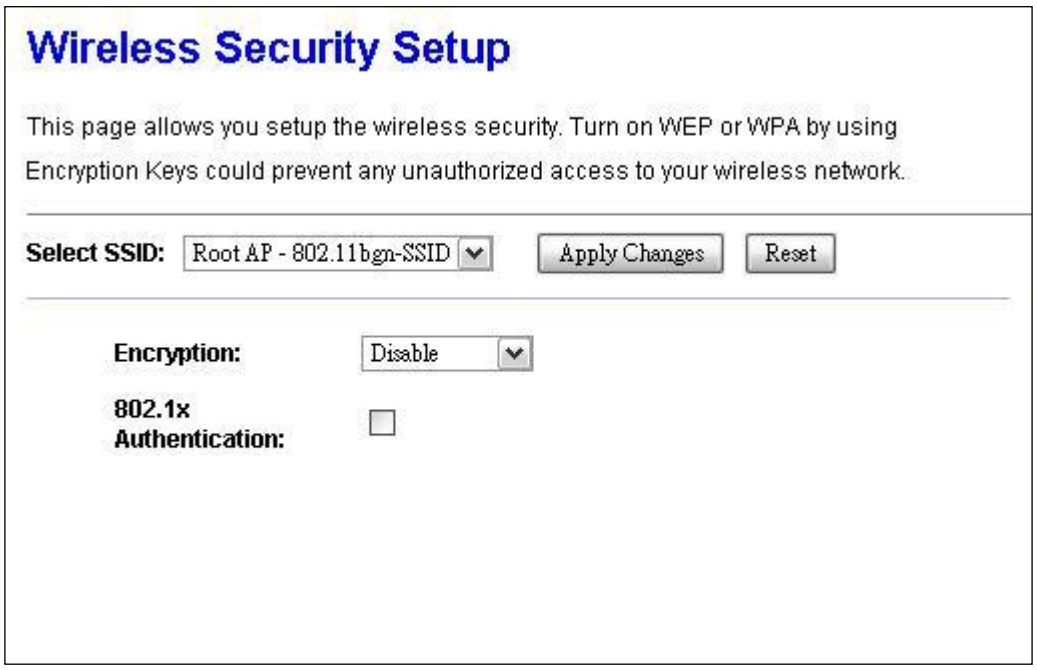
## Wireless Basic Settings

This page is used to configure basic wireless parameters like Band, Mode, Network Type SSID, Channel Number, Enable Mac Clone (Single Ethernet Client).



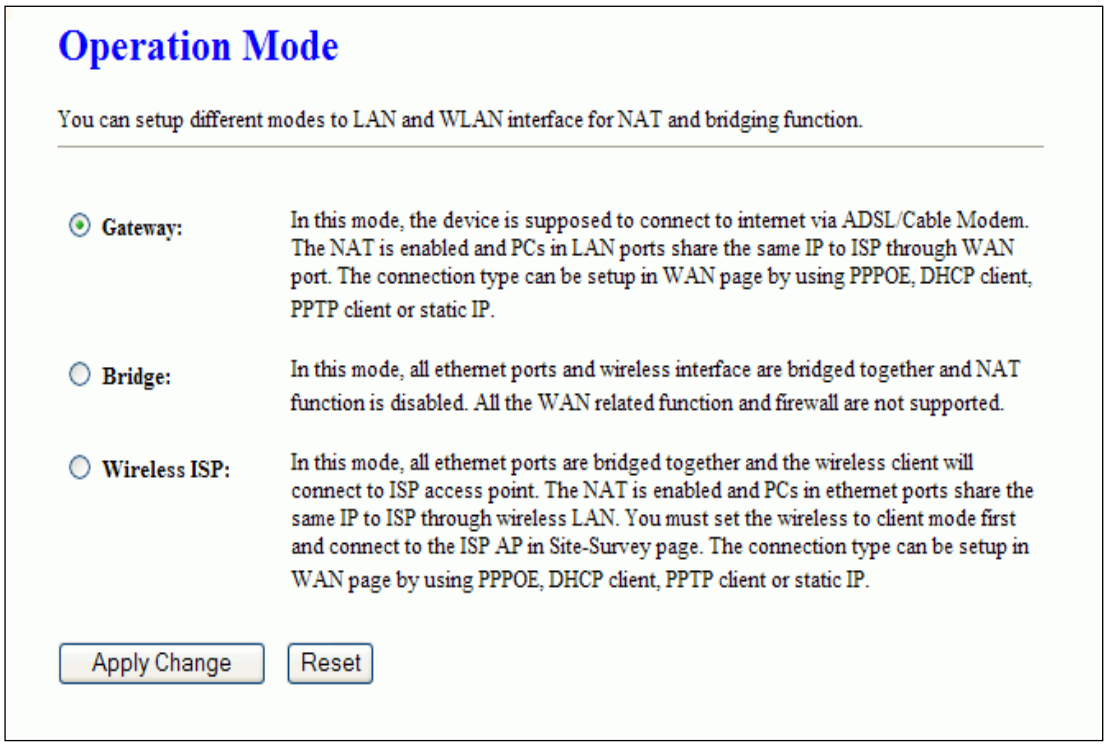

## Wireless Security Setup

This page is used to configure wireless security


Wireless Security Setup
This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.
Select SSID:
Root AP - 802.11bgn-SSID
Apply Changes
Reset
Encryption:
Disable
802.1x Authentication:

# Operation Mode

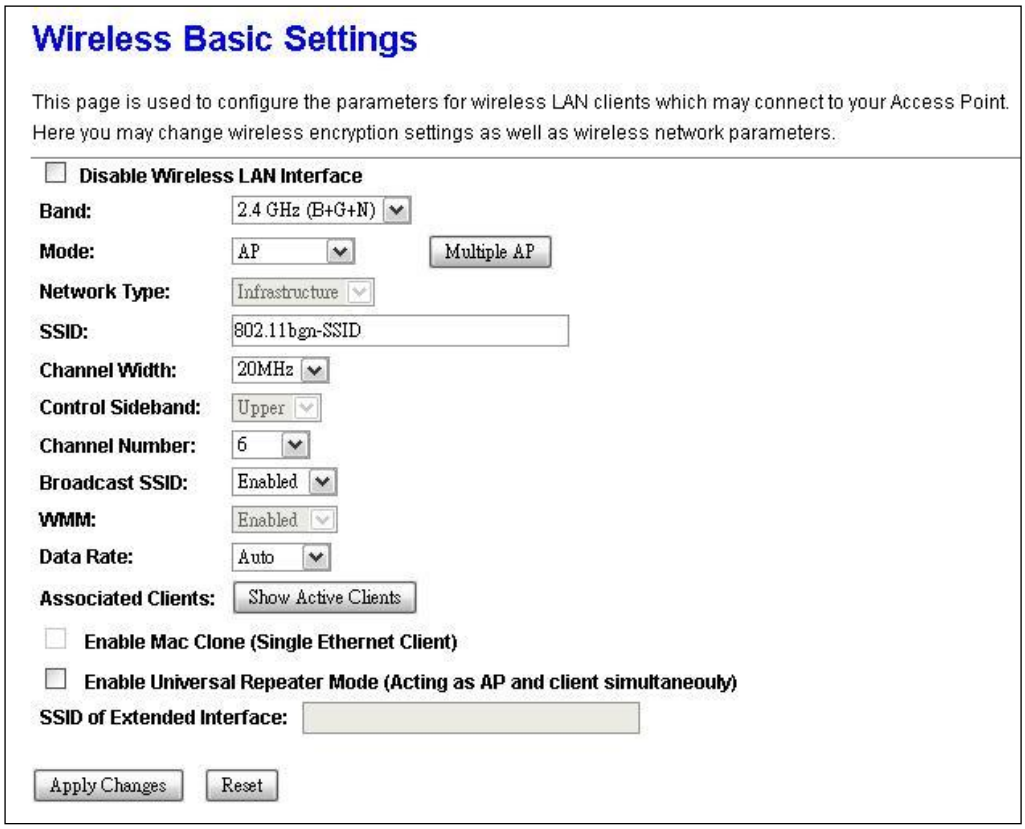
This page is used to configure which mode wireless broadband router acts


Operation Mode
You can setup different modes to LAN and WLAN interface for NAT and bridging function.
Gateway:
In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in LAN ports share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Bridge:
In this mode, all ethernet ports and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.
Wireless ISP:
In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Apply Change
Reset

| Item | Description |
|---|---|
| Gateway | Traditional gateway configuration. It always connects internet via ADSL/Cable Modem. LAN interface, WAN interface, Wireless interface, NAT and Firewall modules are applied to this mode |
| Bridge | Each interface (LAN, WAN and Wireless) regards as bridge. NAT, Firewall and all router's functions are not supported |
| Wireless ISP | Switch Wireless interface to WAN port and all Ethernet ports in bridge mode. Wireless interface can do all router's functions |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

# Wireless - Basic Settings

This page is used to configure the parameters for wireless LAN clients that may connect to your Broadband Router. Here you may change wireless encryption settings as well as wireless network parameters.

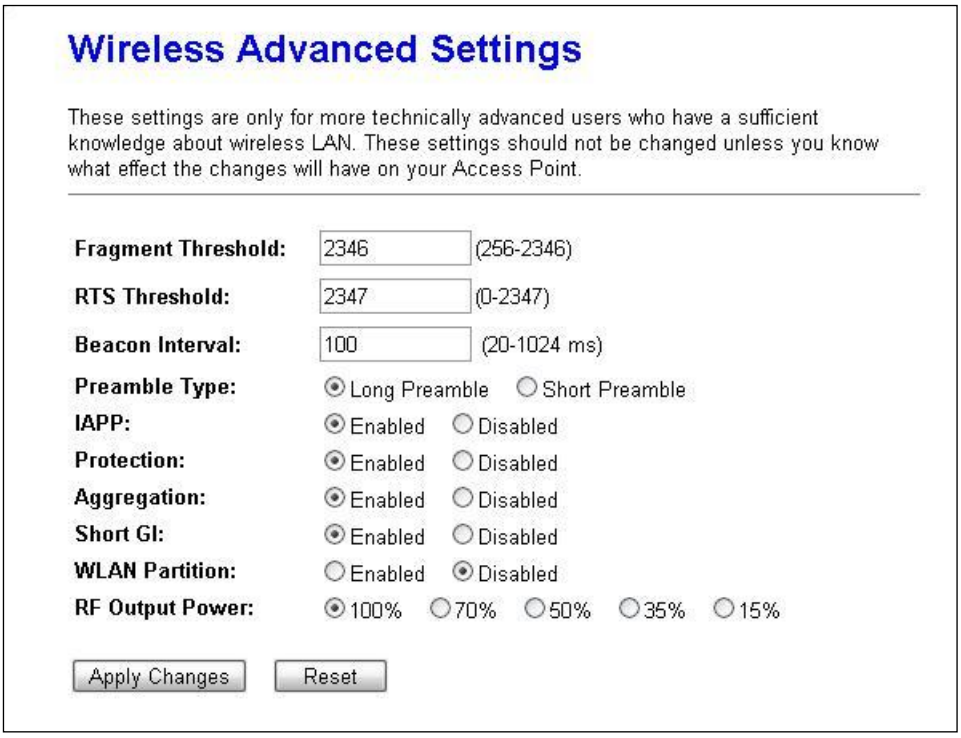



| Item | Description |
|---|---|
| Disable Wireless LAN Interface | Click on to disable the wireless LAN data transmission. |
| Band | Click to select 2.4GHz(B) / 2.4GHz(G) /2.4GHz(B+G) |
| Mode | Click to select the WLAN AP / Client / WDS / AP+WDS wireless mode. |
| Multiple AP | Click to enable multiple AP. |
| Network Type | While network is selected to be client. Click to select network type infrastructure or Ad-Hoc |
| SSID | It is the wireless network name. The SSID can be 32 bytes long. |
| Channel width | Select the operational bandwidth 20MHz or 40MHz (802.11n band only) |
| Control Sideband | Select the sideband with upper or lower for channel width 40MHz. |
| Channel Number | Select the wireless communication channel from pull-down menu. |
| Broadcast SSID | Click to enable or disable the SSID broadcast function |
| WMM | Click to enable or disable WMM function |
| Data Rate | Select transmission data rate from pull-down menu. Data rate can be auto select, 1M to 54Mbps or MCS. |
| Associated Clients | Click the ***Show Active Clients*** button to open Active Wireless Client Table that shows the MAC address, transmit-packet, receive-packet and transmission-rate for each associated wireless client. |
| Enable Mac Clone (Single Ethernet Client) | Take Laptop NIC MAC address as wireless client MAC address. **[Client Mode only]** |

| | |
|---|---|
| Enable Universal Repeater Mode | Click to enable Universal Repeater Mode. (Acting as AP and client simultaneously in this mode). |
| SSID of Extended Interface | Assign SSID when enables Universal Repeater Mode. |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Wireless - Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your WLAN Broadband Router.


Wireless Advanced Settings
These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access Point.
Fragment Threshold: 2346 (256-2346)
RTS Threshold: 2347 (0-2347)
Beacon Interval: 100 (20-1024 ms)
Preamble Type: Long Preamble Short Preamble
IAPP: Enabled Disabled
Protection: Enabled Disabled
Aggregation: Enabled Disabled
Short GI: Enabled Disabled
WLAN Partition: Enabled Disabled
RF Output Power: 100% 70% 50% 35% 15%
Apply Changes
Reset

| Item | Description |
|---|---|
| Fragment Threshold | Set the data packet fragmentation threshold, value can be written between 256 and 2346 bytes. |
| RTS Threshold | Set the RTS Threshold, value can be written between 0 and 2347 bytes. |
| Beacon Interval | Set the Beacon Interval, value can be written between 20 and 1024ms. |
| Preamble Type | Click to select the ***Long Preamble*** or ***Short Preamble*** support on the wireless data packet transmission. |
| IAPP | Click to enable or disable the IAPP function. |
| Protection | Protection is for neighboring 802.11b wireless network. Select disable to reduce the adverse affect of legacy wireless network 802.11n performance. This option is available only when 802.11 mode is set to 802.11n only |
| Aggregation | Click to enable or disable aggregation function. |
| Short GI | Click to enable or disable short Guard Intervals function |
| WLAN Partition | Enabling WLAN Partition prevents associated wireless clients from communicating with each other. |
| RF Output power | To adjust transmission power level. |

## Wireless - Security Setup

This page allows you setup the wireless security. Turn on WEP, WPA; WPA2 by using encryption keys could prevent any unauthorized access to your wireless network.

Wireless Security Setup
This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.
Select SSID:
Root AP - 802.11bgn-SSID
Apply Changes
Reset
Encryption:
Disable
802.1x Authentication:

| Item | Description |
|---|---|
| Select SSID | Select SSID to be encrypted from multiple APs. |
| Encryption | Select the encryption supported over wireless access. The encryption method can be None, WEP, WPA(TKIP), WPA2 or WPA2 Mixed |
| Use 802.1x Authentication | While Encryption is selected to be WEP. Click the check box to enable IEEE 802.1x authentication function. |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Wireless - Access Control

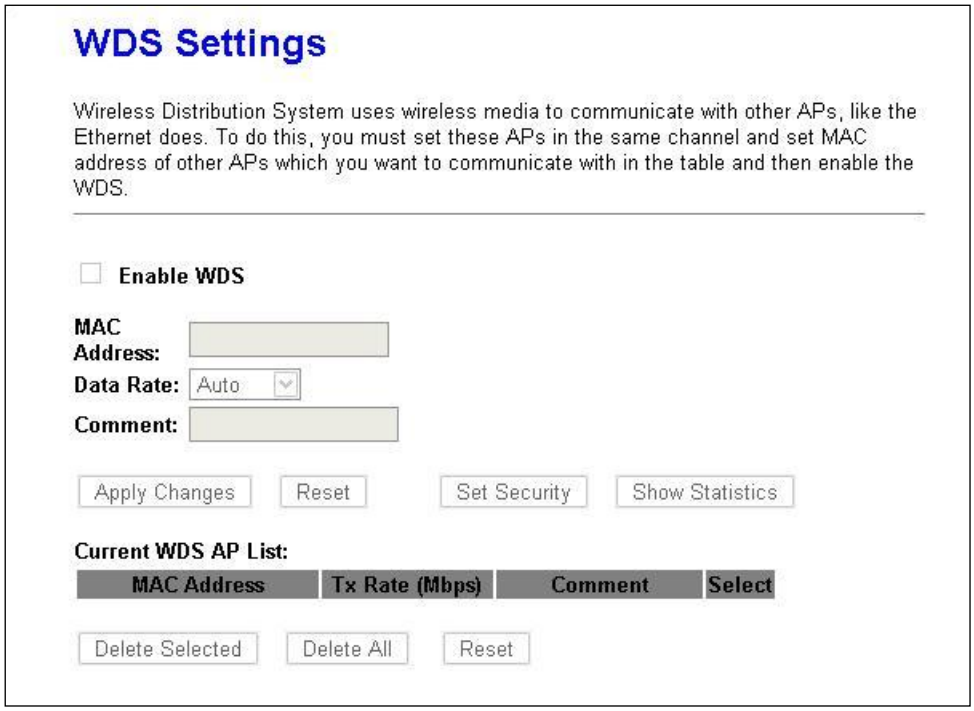
If you enable wireless access control, only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When this option is enabled, no wireless clients will be able to connect if the list contains no entries.

Wireless Access Control
If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point.
Wireless Access Control Mode:
Disable
MAC Address:
Comment:
Apply Changes
Reset
Current Access Control List:
MAC Address
Comment
Select
Delete Selected
Delete All
Reset

| Item | Description |
|---|---|
| Wireless Access Control Mode | Click the ***Disabled***, ***Allow Listed*** or ***Deny Listed*** of drop down menu choose wireless access control mode. This is a security control function; only those clients registered in the access control list can link to this WLAN Broadband Router. |
| MAC Address | Fill in the MAC address of client to register this WLAN Broadband Router access capability. |
| Comment | Enter notes for the registered client. |
| Apply Changes | Click the ***Apply Changes*** button to register the client to new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Current Access Control List | It shows the registered clients that are allowed to link to this WLAN Broadband Router. |
| Delete Selected | Click to delete the selected clients that will be access right removed from this WLAN Broadband Router. |
| Delete All | Click to delete all the registered clients from the access allowed list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other AP that you want to communicate with in the table and then enable the WDS.


WDS Settings
Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.
Enable WDS
MAC Address:
Data Rate:
Auto
Comment:
Apply Changes
Reset
Set Security
Show Statistics
Current WDS AP List:
MAC Address
Tx Rate (Mbps)
Comment
Select
Delete Selected
Delete All
Reset

| Item | Description |
|---|---|
| Enable WDS | Click the ***Disabled***, ***Allow Listed*** or ***Deny Listed*** of drop down menu choose wireless access control mode. This is a security control function; only those clients registered in the access control list can link to this WLAN Broadband Router. |
| MAC Address | Fill in the MAC address of client to register this WLAN Broadband Router access capability. |
| Data Rate | Select transmission data rate from pull down menu. |

| | |
|---|---|
| | Data rate can be auto-selected, 1Mbps to 54Mbps or MCS. |
| Comment | Fill in the comments for the registered client. |
| Apply Changes | Click the ***Apply Changes*** button to register the client to new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Set Security | Click button to configure wireless security like ***WEP(64bits), WEP(128bits), WPA(TKIP), WPA2(AES)*** or ***None*** |
| Show Statistics | It shows the TX, RX packets, rate statistics |
| Delete Selected | Click to delete the selected clients that will be removed from the wireless distribution system. |
| Delete All | Click to delete all the registered APs from the wireless distribution system allowed list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

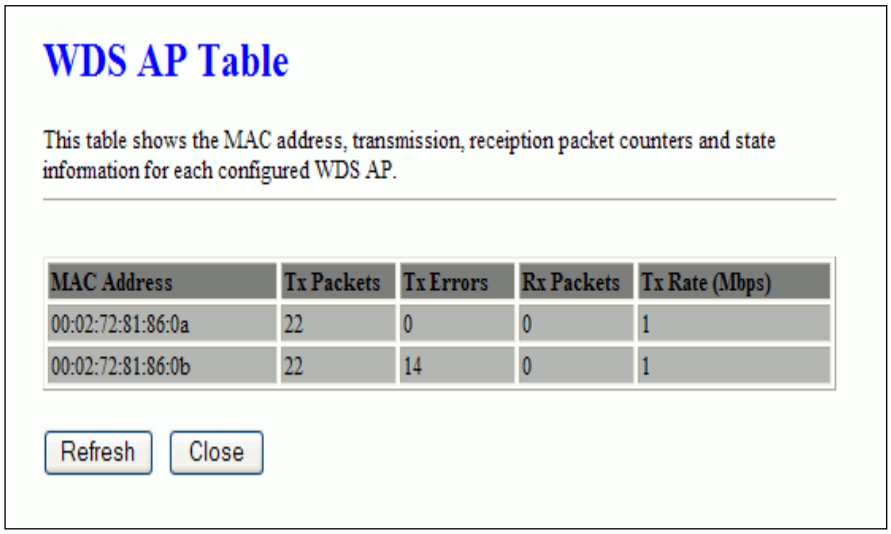
It shows the registered clients that are allowed to link to this WLAN Broadband Router.

## WDS Security Setup

Requirement: Set [Wireless]->[Basic Settings]->[Mode]->AP+WDS
This page is used to configure the wireless security between APs.

## WDS AP Table

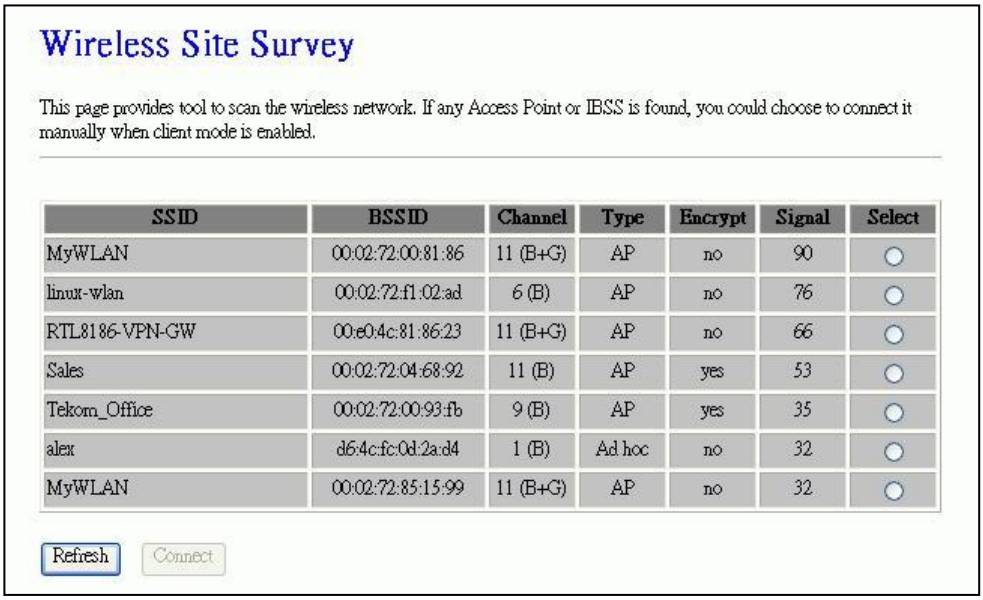
This page is used to show WDS statistics




| Item | Description |
|---|---|
| MAC Address | It shows the MAC Address within WDS. |
| Tx Packets | It shows the statistic count of sent packets on the wireless LAN interface. |
| Tx Errors | It shows the statistic count of error sent packets on the Wireless LAN interface. |
| Rx Packets | It shows the statistic count of received packets on the wireless LAN interface. |
| Tx Rate (Mbps) | It shows the wireless link rate within WDS. |
| Refresh | Click to refresh the statistic counters on the screen. |
| Close | Click to close the current window. |

## Site Survey

This page is used to scan and connect nearby APs when operate at client mode.



| Item | Description |
|---|---|
| SSID | It shows the SSID of AP. |
| BSSID | It shows BSSID of AP. |
| Channel | It show the current channel of AP occupied. |
| Type | It shows which type of connection to be connect, infrastructure (AP) or ad-hoc. |
| Encrypt | It shows the encryption status. |
| Signal | It shows signal strength (expressed in percentage) of current AP. |
| Refresh | Click the ***Refresh*** button to re-scan site survey on the screen. |
| Connect | Click the ***Connect*** button to establish connection. |

# WPS

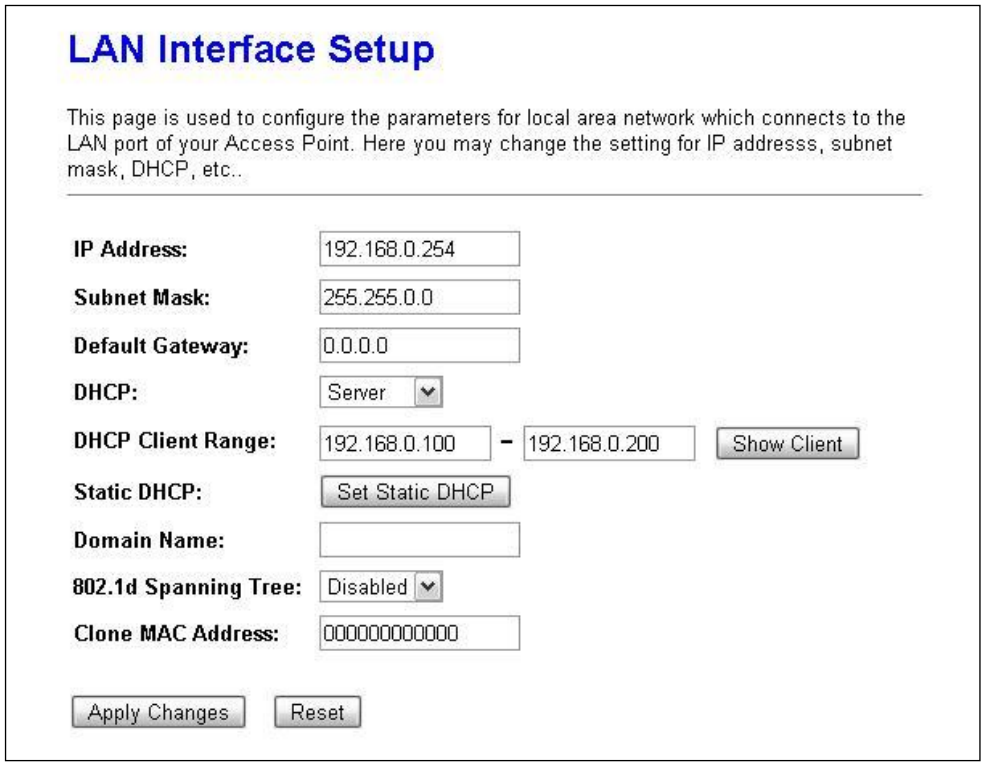
This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automatically synchronize its setting and connect to the Access Point in a minute without any hassle.

Wi-Fi Protected Setup
This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automically syncronize its setting and connect to the Access Point in a minute without any hassle.
Disable WPS
WPS Status:
Configured
UnConfigured
Reset to UnConfigured
Self-PIN Number:
08904089
Push Button Configuration:
Start PBC
Apply Changes
Reset
Client PIN Number:
Start PIN

| Item | Description |
|---|---|
| Disable WPS | Click on to disable the Wi-Fi Protected Setup function |
| WPS Status | Show WPS status is Configured or Unconfigured |
| Self-PIN Number | Fill in the PIN Number of AP to register the wireless distribution system access capability. |
| Push Button Configuration | The Start PBC button provides tool to scan the wireless network. If any Access Point or IBSS is found, you could connect it automatically when client join PBC mode. |
| Apply Changes | Click the Apply Changes button to complete the new configuration setting. |
| Reset | Click the Reset button to abort change and recover the previous configuration setting. |
| Client PIN Number | Fill in the Client PIN Number from your Client sites. |

# LAN Interface Setup

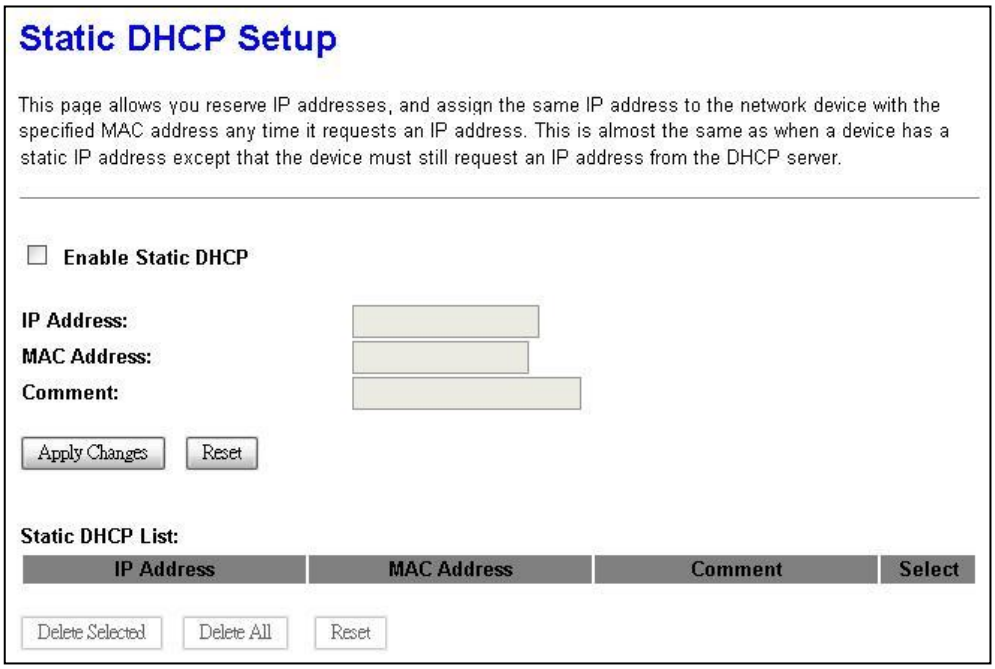
This page is used to configure the parameters for local area network that connects to the LAN ports of your WLAN Broadband Router. Here you may change the setting for IP address, subnet mask, DHCP, etc.




| Item | Description |
|---|---|
| IP Address | Fill in the IP address of LAN interfaces of this WLAN Access Point. |
| Subnet Mask | Fill in the subnet mask of LAN interfaces of this WLAN Access Point. |
| Default Gateway | Fill in the default gateway for LAN interfaces out going data packets. |
| DHCP | Click to select ***Disabled***, ***Client*** or ***Server*** in different operation mode of wireless Access Point. |
| DHCP Client Range | Fill in the start IP address and end IP address to allocate a range of IP addresses; client with DHCP function set will be assigned an IP address from the range. |
| Show Client | Click to open ***Active DHCP Client Table*** window that shows current active clients with their assigned IP address, MAC address and expire time information **[Server mode only]** |
| Static DHCP | Select to enable or disable Static DHCP from pull-down menu **[Server mode only]** |
| Domain Name | Assign Domain Name and dispatch to DHCP clients. It is optional field. |
| 802.1d Spanning Tree | Select to enable or disable the IEEE 802.1d Spanning Tree function from pull-down menu. |
| Clone MAC Address | Fill in the MAC address that is the MAC address to be cloned. |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

# Static DHCP Setup

This page allows you reserve IP addresses, and assign the same IP address to the network device with the specified MAC address any time it requests an IP address. This is almost the same as when a device has a static IP address except that the device must still request an IP address from the DHCP server

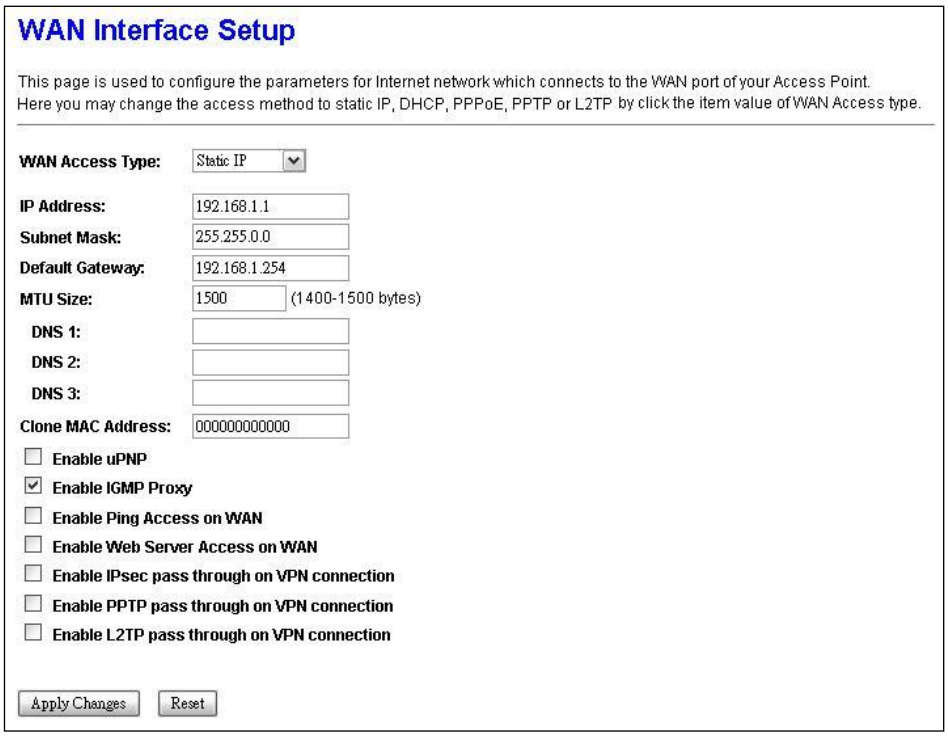

Static DHCP Setup
This page allows you reserve IP addresses, and assign the same IP address to the network device with the specified MAC address any time it requests an IP address. This is almost the same as when a device has a static IP address except that the device must still request an IP address from the DHCP server.
Enable Static DHCP
IP Address:
MAC Address:
Comment:
Apply Changes
Reset
Static DHCP List:
IP Address
MAC Address
Comment
Select
Delete Selected
Delete All
Reset

| Item | Description |
|---|---|
| Enable Static DHCP | Click to enable ***Static DHCP*** |
| IP Address | Enter the Static IP Address in the **IP Address** field |
| MAC Address | Enter the MAC address of the corresponding Client in the **MAC Address** field |
| Comment | Take notes of the setting. |
| Apply Changes | Click the ***Apply Changes*** button to complete the change |
| Static DHCP List | List mapping of static IP address to corresponding clients. |
| IP Address | Assigned static IP address |
| MAC address | MAC address of corresponding client |
| Comment | Notes of the mapping |
| Select | Click on checkbox if you want to delete from the list. |
| Delete Selected | Click to delete current selected from the list. |
| Delete All | Delete all of the entries from the list. |
| Reset | Uncheck all of previous selections. |

# WAN Interface Setup

This page is used to configure the parameters for wide area network that connects to the WAN port of your WLAN Broadband Router. Here you may change the access method to ***Static IP***, ***DHCP***, ***PPPoE*** or ***PPTP*** by click the item value of **WAN Access Type**.

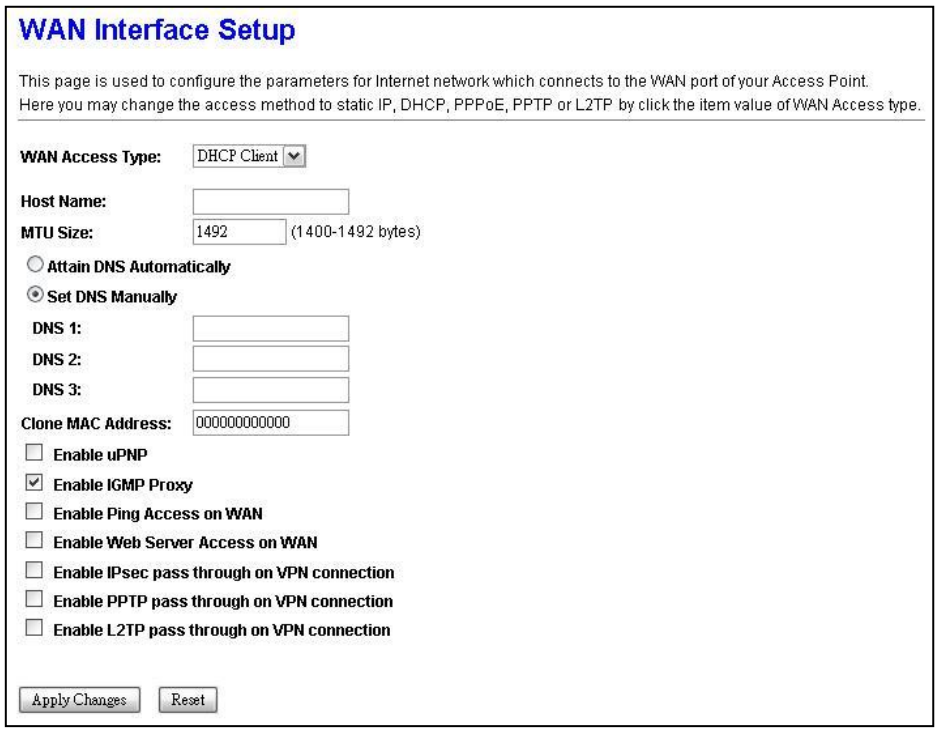
### Static IP


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point.
Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.
WAN Access Type:
Static IP
IP Address:
192.168.1.1
Subnet Mask:
255.255.0.0
Default Gateway:
192.168.1.254
MTU Size:
1500
(1400-1500 bytes)
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address:
000000000000
Enable uPNP
Enable IGMP Proxy
Enable Ping Access on WAN
Enable Web Server Access on WAN
Enable IPsec pass through on VPN connection
Enable PPTP pass through on VPN connection
Enable L2TP pass through on VPN connection
Apply Changes
Reset

| Item | Description |
|---|---|
| Static IP | Click to select Static IP support on WAN interface. There are IP address, subnet mask and default gateway settings need to be done |
| IP Address | If you select the Static IP support on WAN interface, fill in the IP address for it. |
| Subnet Mask | If you select the Static IP support on WAN interface, fill in the subnet mask for it |
| Default Gateway | If you select the Static IP support on WAN interface, fill in the default gateway for WAN interface out going data packets. |
| MTU Size | Fill in the mtu size of MTU Size. The default value is 1400 |
| DNS 1 | Enter the IP address of Domain Name Server 1. |
| DNS 2 | Enter the IP address of Domain Name Server 2. |
| DNS 3 | Enter the IP address of Domain Name Server 3. |
| Clone MAC Address | Enter the MAC address that is the MAC address to be cloned |
| Enable uPNP | Click the checkbox to enable uPNP function. |
| Enable IGMP Proxy | Click the checkbox to enable IGMP proxy |
| Enable Ping Access on WAN | Click the checkbox to enable WAN IGMP response. |
| Enable Web server Access on WAN | Click the checkbox to enable web configuration from WAN side |
| Enable IPsec pass through on VPN connection | Click the checkbox to enable IPSec packet pass through |
| Enable PPTP pass through on VPN connection | Click the checkbox to enable PPTP packet pass through |
| Enable L2TP pass through on VPN connection | Click the checkbox to enable L2TP packet pass through |

| | |
|---|---|
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

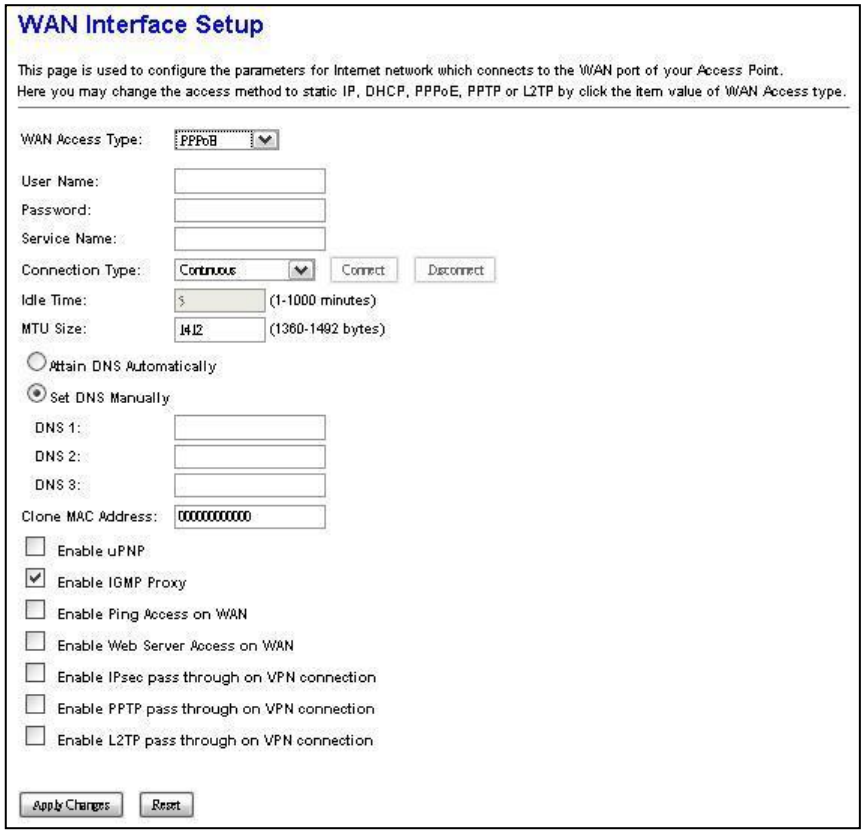
## DHCP Client


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point.
Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.
WAN Access Type:
DHCP Client
Host Name:
MTU Size:
1492
(1400-1492 bytes)
Attain DNS Automatically
Set DNS Manually
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address:
000000000000
Enable uPNP
Enable IGMP Proxy
Enable Ping Access on WAN
Enable Web Server Access on WAN
Enable IPsec pass through on VPN connection
Enable PPTP pass through on VPN connection
Enable L2TP pass through on VPN connection
Apply Changes
Reset

| Item | Description |
|---|---|
| DHCP Client | Click to select DHCP support on WAN interface for IP address assigned automatically from a DHCP server. |
| Host Name | Fill in the host name of Host Name. The default value is empty |
| MTU Size | Fill in the mtu size of MTU Size. The default value is 1400 |
| Attain DNS Automatically | Click to select getting DNS address for ***DHCP*** support. Please select ***Set DNS Manually*** if the ***DHCP*** support is selected. |
| Set DNS Manually | Click to select getting DNS address for ***DHCP*** support. |
| DNS 1 | Fill in the IP address of Domain Name Server 1. |
| DNS 2 | Fill in the IP address of Domain Name Server 2. |
| DNS 3 | Fill in the IP address of Domain Name Server 3. |
| Clone MAC Address | Fill in the MAC address that is the MAC address to be cloned |
| Enable uPNP | Click the checkbox to enable uPNP function. |
| Enable IGMP Proxy | Click the checkbox to enable IGMP proxy |
| Enable Ping Access on WAN | Click the checkbox to enable WAN IGMP response. |
| Enable Web server Access on WAN | Click the checkbox to enable web configuration from WAN side |
| Enable IPsec pass through on VPN connection | Click the checkbox to enable IPSec packet pass through |
| Enable PPTP pass through on VPN connection | Click the checkbox to enable PPTP packet pass through |
| Enable L2TP pass through on VPN connection | Click the checkbox to enable L2TP packet pass through |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |

| | |
|---|---|
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

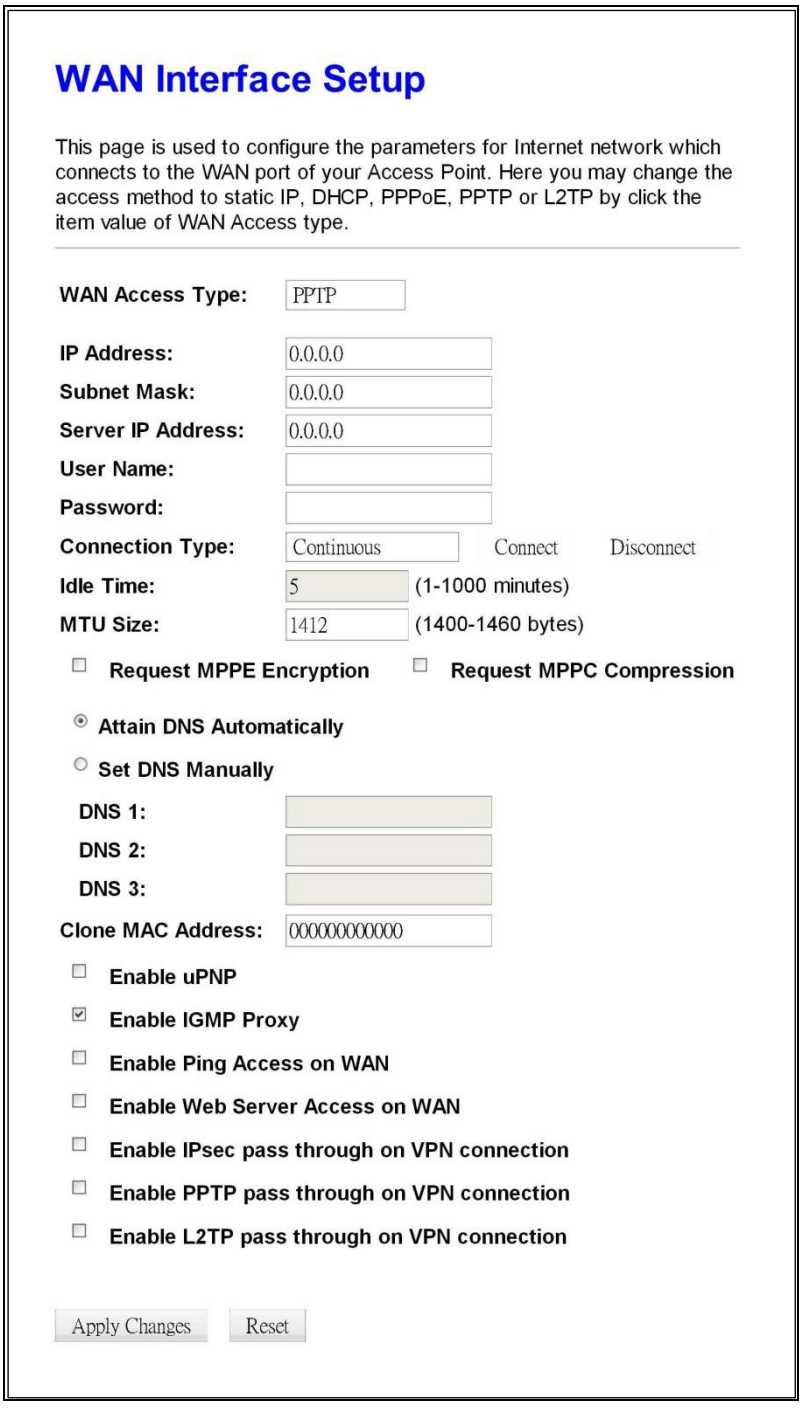
## PPPoE




| Item | Description |
|---|---|
| PPPoE | Click to select PPPoE support on WAN interface. There are user name, password, connection type and idle time settings need to be done. |
| User Name | If you select the PPPoE support on WAN interface, fill in the user name and password to login the PPPoE server. |
| Password | If you select the PPPoE support on WAN interface, fill in the user name and password to login the PPPoE server. |
| Service Name | Fill in the service name of Service Name. The default value is empty. |
| Connection Type | Select the connection type from pull-down menu. There are ***Continuous***, ***Connect on Demand*** and ***Manual*** three types to select. ***Continuous*** connection type means to setup the connection through PPPoE protocol whenever this WLAN Broadband Router is powered on.<br>***Connect on Demand*** connection type means to setup the connection through PPPoE protocol whenever you send the data packets out through the WAN interface; there are a watchdog implemented to close the PPPoE connection while there are no data sent out longer than the idle time set. ***Manual*** connection type means to setup the connection through the PPPoE protocol by clicking the ***Connect*** button manually, and clicking the ***Disconnect*** button manually. |
| Idle Time | If you select the ***PPPoE*** and ***Connect on Demand*** connection type, fill in the idle time for |

| | |
|---|---|
| | auto-disconnect function. Value can be between 1 and 1000 minutes. |
| MTU Size | Fill in the mtu size of MTU Size. The default value is 1400 |
| Attain DNS Automatically | Click to select getting DNS address for ***DHCP*** support. Please select ***Set DNS Manually*** if the ***DHCP*** support is selected. |
| Set DNS Manually | Click to select getting DNS address for ***DHCP*** support. |
| DNS 1 | Fill in the IP address of Domain Name Server 1. |
| DNS 2 | Fill in the IP address of Domain Name Server 2. |
| DNS 3 | Fill in the IP address of Domain Name Server 3. |
| Clone MAC Address | Fill in the MAC address that is the MAC address to be cloned |
| Enable uPNP | Click the checkbox to enable uPNP function. |
| Enable IGMP Proxy | Click the checkbox to enable IGMP proxy |
| Enable Ping Access on WAN | Click the checkbox to enable WAN IGMP response. |
| Enable Web server Access on WAN | Click the checkbox to enable web configuration from WAN side |
| Enable IPsec pass through on VPN connection | Click the checkbox to enable IPSec packet pass through |
| Enable PPTP pass through on VPN connection | Click the checkbox to enable PPTP packet pass through |
| Enable L2TP pass through on VPN connection | Click the checkbox to enable L2TP packet pass through |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

**PPTP**

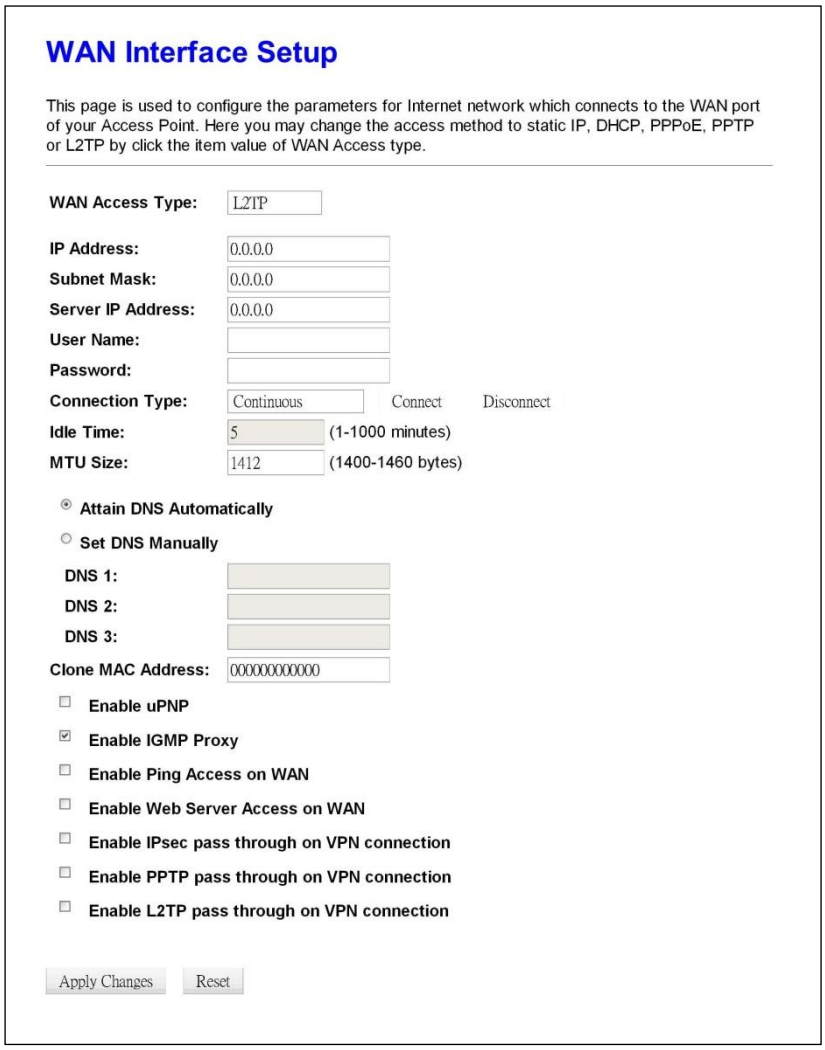

WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.
WAN Access Type: PPTP
IP Address: 0.0.0.0
Subnet Mask: 0.0.0.0
Server IP Address: 0.0.0.0
User Name:
Password:
Connection Type: Continuous Connect Disconnect
Idle Time: 5 (1-1000 minutes)
MTU Size: 1412 (1400-1460 bytes)
Request MPPE Encryption
Request MPPC Compression
Attain DNS Automatically
Set DNS Manually
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address: 000000000000
Enable uPNP
Enable IGMP Proxy
Enable Ping Access on WAN
Enable Web Server Access on WAN
Enable IPsec pass through on VPN connection
Enable PPTP pass through on VPN connection
Enable L2TP pass through on VPN connection
Apply Changes
Reset

| Item | Description |
|---|---|
| PPTP | Allow user to make a tunnel with remote site directly to secure the data transmission among the connection. User can use embedded PPTP client supported by this router to make a VPN connection. |
| IP Address | If you select the PPTP support on WAN interface, fill in the IP address for it. |
| Subnet Mask | If you select the PPTP support on WAN interface, fill in the subnet mask for it. |
| Server IP Address | Enter the IP address of the PPTP Server. |
| User Name | If you select the PPTP support on WAN interface, fill in the user name and password to login the PPTP server. |
| Password | If you select the PPTP support on WAN interface, fill in the user name and password to login the PPTP server. |
| Connection Type | Select the connection type from pull-down menu. |

| | |
|---|---|
| | There are ***Continuous***, ***Connect on Demand*** and ***Manual*** three types to select. ***Continuous*** connection type means to setup the connection through PPPoE protocol whenever this WLAN Broadband Router is powered on.<br>***Connect on Demand*** connection type means to setup the connection through PPPoE protocol whenever you send the data packets out through the WAN interface; there are a watchdog implemented to close the PPPoE connection while there are no data sent out longer than the idle time set. ***Manual*** connection type means to setup the connection through the PPPoE protocol by clicking the ***Connect*** button manually, and clicking the ***Disconnect*** button manually. |
| Idle Time | The amount of time of inactivity before the device will disconnect your PPTP session. |
| MTU Size | Fill in the mtu size of MTU Size. The default value is 1400 |
| Request MPPE Encryption | Click the checkbox to enable request MPPE encryption. |
| Request MPPC Compression | Click the checkbox to enable request MPPC compression. |
| Attain DNS Automatically | Click to select getting DNS address for ***DHCP*** support. Please select ***Set DNS Manually*** if the ***DHCP*** support is selected. |
| Set DNS Manually | Click to select getting DNS address for ***DHCP*** support. |
| DNS 1 | Fill in the IP address of Domain Name Server 1. |
| DNS 2 | Fill in the IP address of Domain Name Server 2. |
| DNS 3 | Fill in the IP address of Domain Name Server 3. |
| Clone MAC Address | Fill in the MAC address that is the MAC address to be cloned |
| Enable uPNP | Click the checkbox to enable uPNP function. |
| Enable IGMP Proxy | Click the checkbox to enable IGMP proxy |
| Enable Ping Access on WAN | Click the checkbox to enable WAN IGMP response. |
| Enable Web server Access on WAN | Click the checkbox to enable web configuration from WAN side |
| Enable IPsec pass through on VPN connection | Click the checkbox to enable IPSec packet pass through |
| Enable PPTP pass through on VPN connection | Click the checkbox to enable PPTP packet pass through |
| Enable L2TP pass through on VPN connection | Click the checkbox to enable L2TP packet pass through |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## L2tP

Use Layer 2 Tunneling Protocol (L2TP) if your ISP uses an L2TP connection. Your ISP will provide you with a username and password.

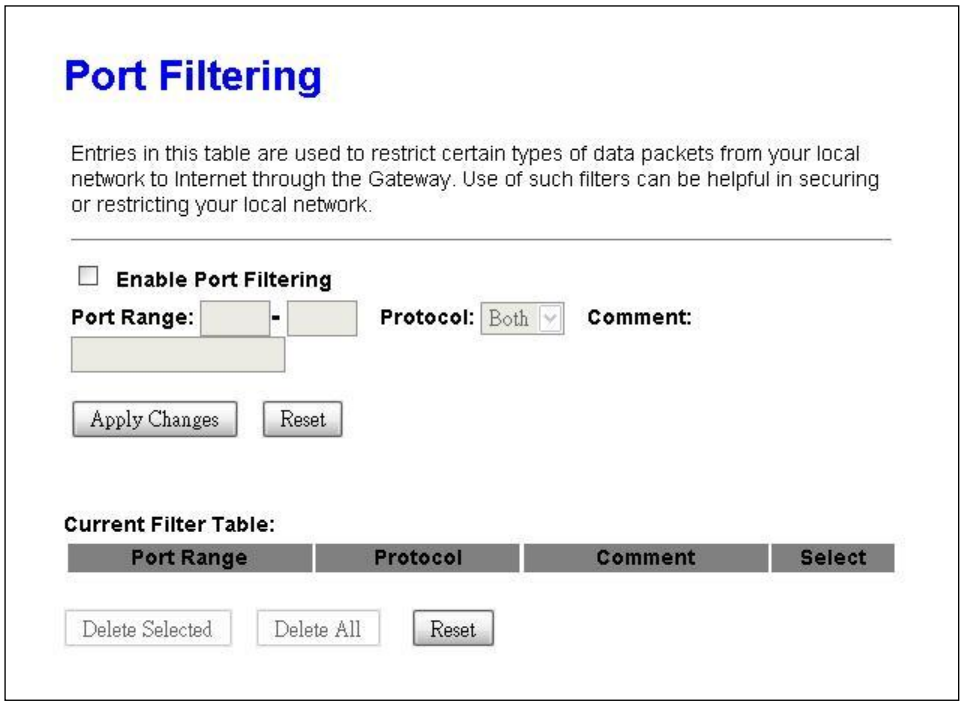

WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.
WAN Access Type: L2TP
IP Address: 0.0.0.0
Subnet Mask: 0.0.0.0
Server IP Address: 0.0.0.0
User Name:
Password:
Connection Type: Continuous Connect Disconnect
Idle Time: 5 (1-1000 minutes)
MTU Size: 1412 (1400-1460 bytes)
Attain DNS Automatically
Set DNS Manually
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address: 000000000000
Enable uPNP
Enable IGMP Proxy
Enable Ping Access on WAN
Enable Web Server Access on WAN
Enable IPsec pass through on VPN connection
Enable PPTP pass through on VPN connection
Enable L2TP pass through on VPN connection
Apply Changes
Reset

| Item | Description |
|---|---|
| L2TP | Allow user to make a tunnel with remote site directly to secure the data transmission among the connection. User can use embedded PPTP client supported by this router to make a VPN connection. |
| IP Address | Enter L2TP IP address supplied by your ISP (Static only). |
| Subnet Mask | Enter subnet mask. |
| Server IP Address | Enter L2TP Server IP address provided by your ISP. |
| User Name | Enter L2TP service username provided by your ISP. |
| Password | Enter L2TP service password provided by your ISP. |
| Connection Type | Select the connection type from pull-down menu. There are ***Continuous***, ***Connect on Demand*** and ***Manual*** three types to select. ***Continuous*** connection type means to setup the connection through L2TP protocol whenever this WLAN Broadband Router is powered on.<br>***Connect on Demand*** connection type means to setup the connection through L2TP protocol whenever you send the data packets out through the WAN interface; there are a watchdog implemented to close the L2TP connection while there are no data sent out longer than the idle time set. ***Manual*** connection type means to setup the connection through the L2TP protocol by clicking the ***Connect*** button manually, and clicking the ***Disconnect*** button manually. |
| Idle Time | The amount of time of inactivity before the device will disconnect your L2TP session. |

| | |
|---|---|
| MTU Size | Change the MTU size that your ISP provided. The default value is 1400 and range is 1400 to 1460 bytes. |
| Attain DNS Automatically | Click to get DNS IP address automatically. |
| Set DNS Manually | Enter DNS IP address provided by your ISP manually. |
| DNS 1 | Enter the IP address of Domain Name Server 1. |
| DNS 2 | Enter the IP address of Domain Name Server 2. |
| DNS 3 | Enter the IP address of Domain Name Server 3. |
| Clone MAC Address | Clone MAC address of your computer. |
| Enable uPNP | Click the checkbox to enable uPNP function. |
| Enable IGMP Proxy | Click the checkbox to enable IGMP proxy |
| Enable Ping Access on WAN | Click the checkbox to enable WAN IGMP response. |
| Enable Web server Access on WAN | Click the checkbox to enable web configuration from WAN side |
| Enable IPsec pass through on VPN connection | Click the checkbox to enable IPSec packet pass through |
| Enable PPTP pass through on VPN connection | Click the checkbox to enable PPTP packet pass through |
| Enable L2TP pass through on VPN connection | Click the checkbox to enable L2TP packet pass through |
| Apply Changes | Click the ***Apply Changes*** button to complete the new configuration setting. |

## Firewall - Port Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

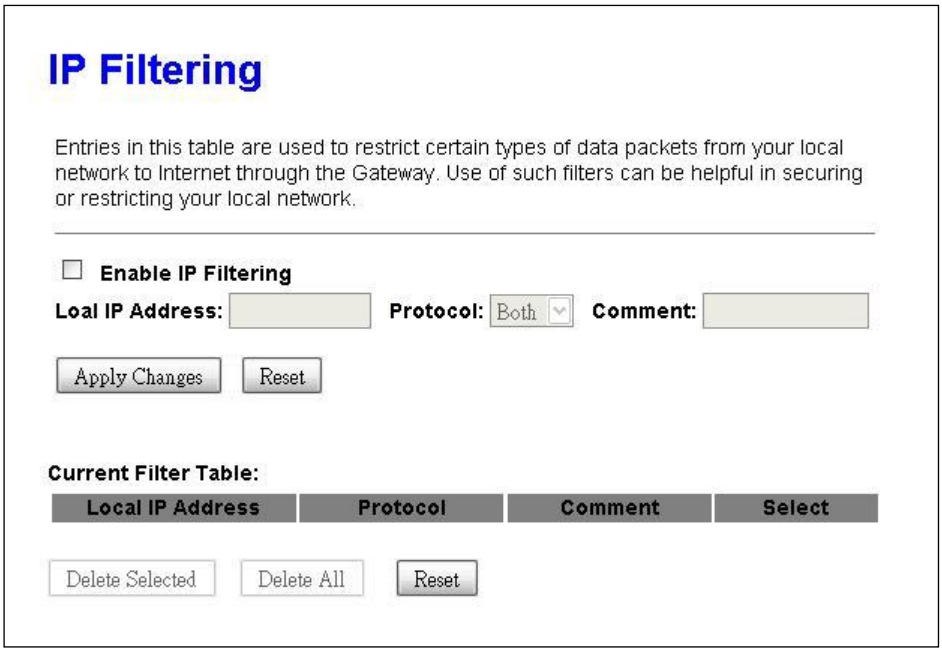



| Item | Description |
|---|---|
| Enable Port Filtering | Click to enable the port filtering security function. |
| Port Range Protocol, Comments | To restrict data transmission from the local network on certain ports, fill in the range of Start-port and end-port, and the protocol, also put your comments on it. The ***Protocol*** can be TCP, UDP or Both. ***Comments*** let you know about whys to restrict data from the ports. |
| Apply Changes | Click the ***Apply Changes*** button to register the ports |

| | |
|---|---|
| | to port filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Delete Selected | Click to delete the selected port range that will be removed from the port-filtering list. |
| Delete All | Click to delete all the registered entries from the port-filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Firewall - IP Filtering

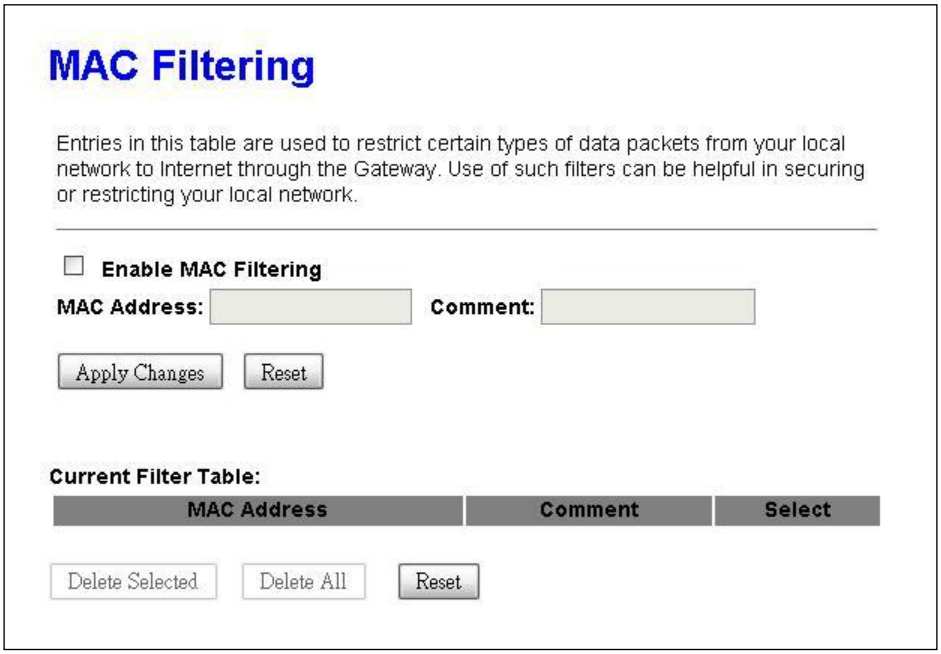
Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.




| Item | Description |
|---|---|
| Enable IP Filtering | Click to enable the IP filtering security function. |
| Local IP Address; Protocol; Comments | To restrict data transmission from local network on certain IP addresses, fill in the IP address and the protocol; also put your comments on it.<br>The ***Protocol*** can be TCP, UDP or Both. ***Comments*** let you know about whys to restrict data from the IP address. |
| Apply Changes | Click the ***Apply Changes*** button to register the IP address to IP filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Delete Selected | Click to delete the selected IP address that will be removed from the IP-filtering list. |
| Delete All | Click to delete all the registered entries from the IP-filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

# Firewall - MAC Filtering

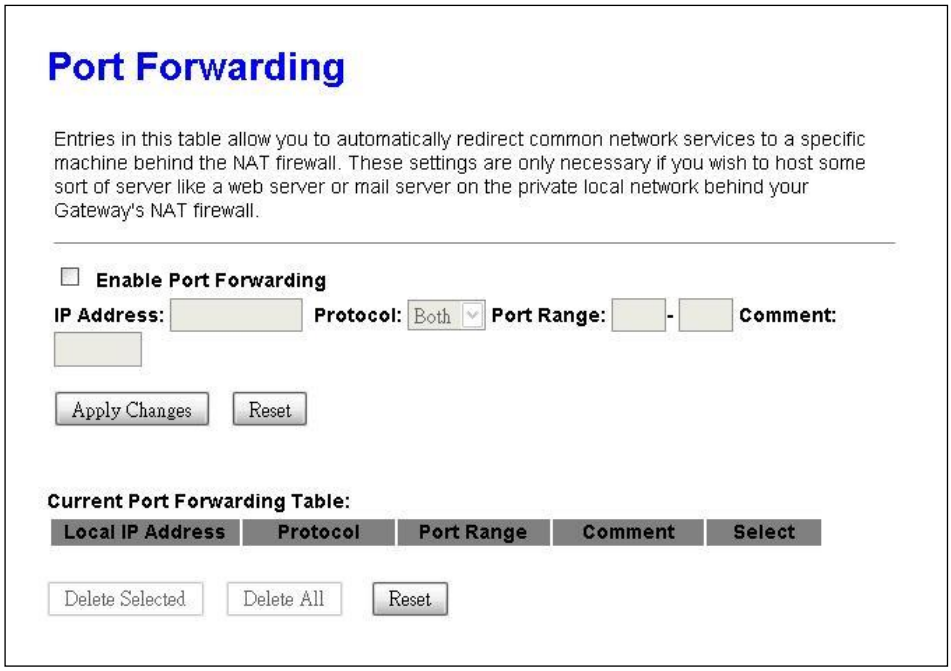
Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.


MAC Filtering
Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.
Enable MAC Filtering
MAC Address:
Comment:
Apply Changes
Reset
Current Filter Table:
MAC Address
Comment
Select
Delete Selected
Delete All
Reset

| Item | Description |
|---|---|
| Enable MAC Filtering | Click to enable the MAC filtering security function. |
| MAC Address; Comments | To restrict data transmission from local network on certain MAC addresses, fill in the MAC address and your comments on it.<br>***Comments*** let you know about whys to restrict data from the MAC address. |
| Apply Changes | Click the ***Apply Changes*** button to register the MAC address to MAC filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Delete Selected | Click to delete the selected MAC address that will be removed from the MAC-filtering list. |
| Delete All | Click to delete all the registered entries from the MAC-filtering list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

# Firewall - Port Forwarding

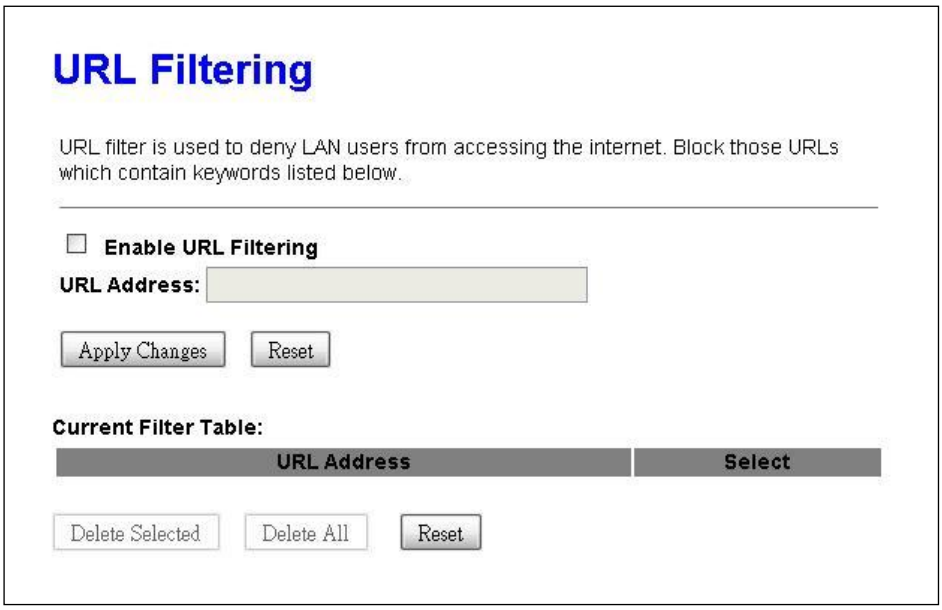
Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.


Port Forwarding
Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.
Enable Port Forwarding
IP Address:
Protocol:
Both
Port Range:
-
Comment:
Apply Changes
Reset
Current Port Forwarding Table:
Local IP Address
Protocol
Port Range
Comment
Select
Delete Selected
Delete All
Reset

| Item | Description |
|---|---|
| Enable Port Forwarding | Click to enable the Port Forwarding security function. |
| Local IP Address<br>Protocol<br>Port Range<br>Comment | To forward data packets coming from WAN to a specific IP address that hosted in local network behind the NAT firewall, fill in the IP address, protocol, port range and your comments.<br>The ***Protocol*** can be TCP, UDP or Both. The ***Port Range*** for data transmission.<br>***Comments*** let you know about whys to allow data packets forward to the IP address and port number. |
| Apply Changes | Click the ***Apply Changes*** button to register the IP address and port number to Port forwarding list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Delete Selected | Click to delete the selected IP address and port number that will be removed from the port-forwarding list. |
| Delete All | Click to delete all the registered entries from the port-forwarding list. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Firewall – URL Filtering

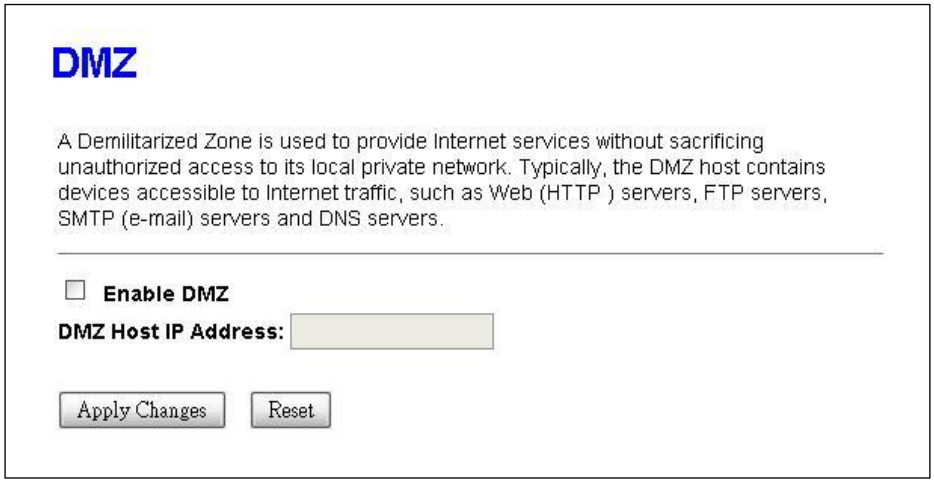
URL Filtering is used to restrict users to access specific websites in internet.




| Item | Description |
|---|---|
| Enable URL Filtering | Click to enable the URL Filtering function. |
| URL Address | Add one URL address. |
| Apply Changes | Click the ***Apply Changes*** button to save settings. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Delete Selected | Click to delete the selected URL address that will be removed from the URL Filtering list. |
| Delete All | Click to delete all the registered entries from the URL Filtering list |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Firewall - DMZ

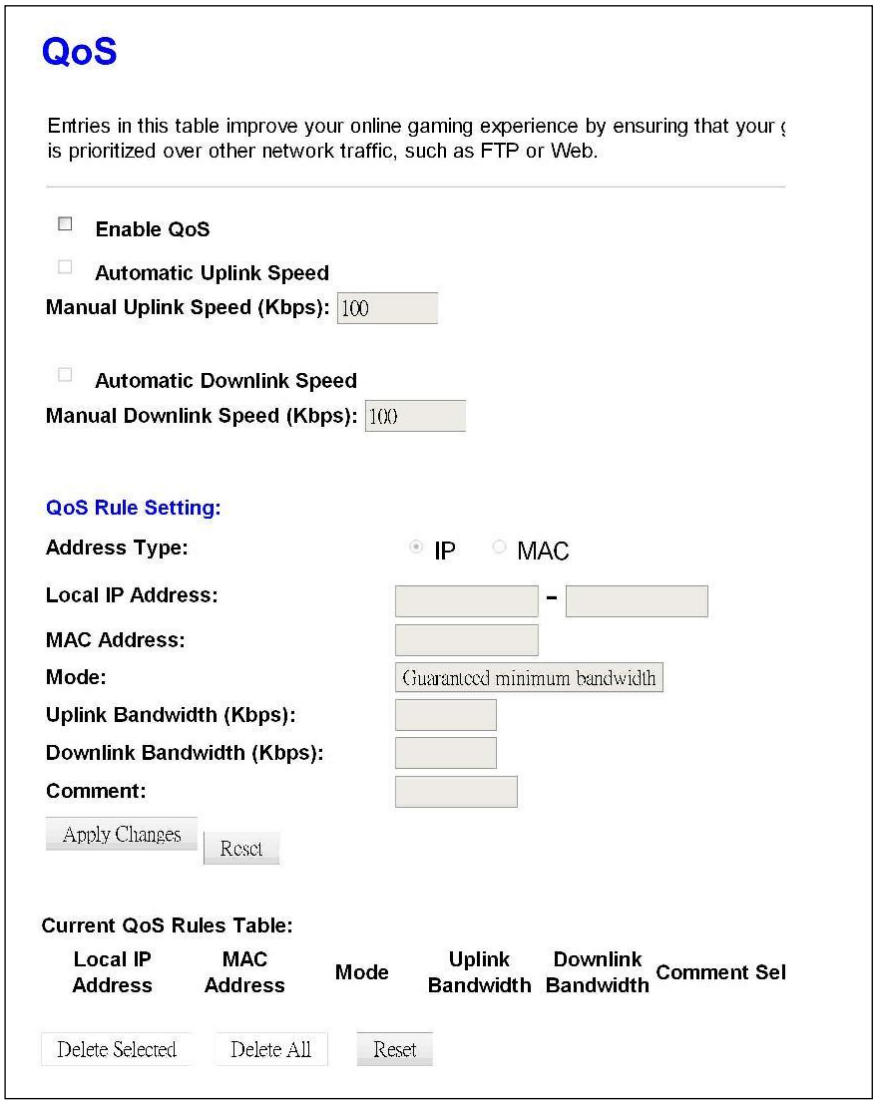
A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.


DMZ
A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP ) servers, FTP servers, SMTP (e-mail) servers and DNS servers.
Enable DMZ
DMZ Host IP Address:
Apply Changes
Reset

| Item | Description |
|---|---|
| Enable DMZ | Click to enable the DMZ function. |
| DMZ Host IP Address | To support DMZ in your firewall design, fill in the IP address of DMZ host that can be access from the WAN interface. |
| Apply Changes | Click the ***Apply Changes*** button to register the IP address of DMZ host. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## QoS

Entries in this table improve your online gaming experience by ensuring that your game traffic is prioritized over other network traffic, such as FTP or Web

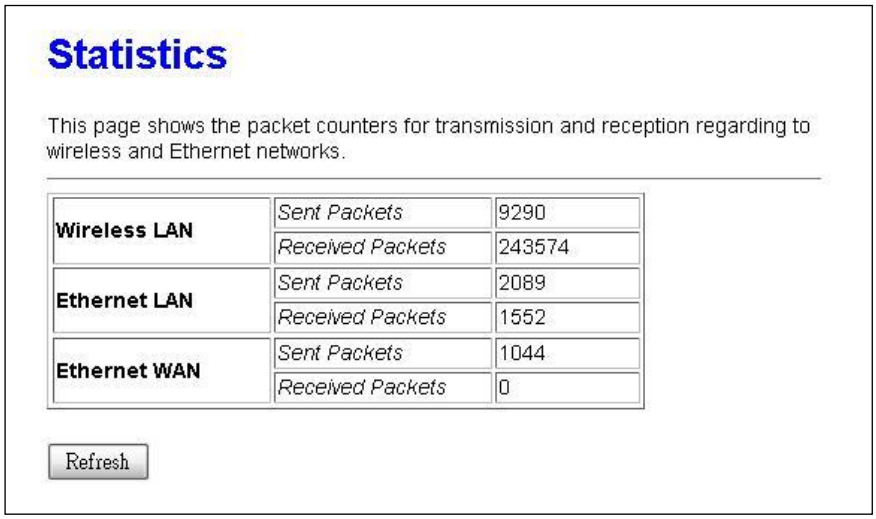



| Item | Description |
|---|---|
| Enable QoS | Click to enable the QoS function. |
| Automatic Uplink Speed | Click checkbox to enable uplink automatic bandwidth control. |
| Manually Uplink Speed [Kbps] | Enter uplink speed in Kbps to constrain maximum uplink bandwidth capacity. |
| Automatic downlink Speed [Kbps] | Click checkbox to enable downlink automatic bandwidth control. |
| QoS Rule Setting | |
| Address Type | Select IP address or MAC address |

| | |
|---|---|
| Local IP Address | Enter local IP address range |
| MAC Address | Enter MAC address you are going to control. |
| Mode | Select band width control type ***Guaranteed minimum bandwidth*** or ***Restricted maximum bandwidth***. |
| Uplink Bandwidth | Enter uplink bandwidth in Kbps |
| Downlink Bandwidth | Enter downlink bandwidth in Kbps |
| Comment | Give a definition to the setting |
| Apply Changes | Click the ***Apply Changes*** button to save the settings |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |
| Current QoS Rule Table | |
| Local IP Address | List LAN IP address that is controlled. |
| MAC Address | List MAC address that is controlled. |
| Mode | List control type that is controlled. ***Guaranteed minimum bandwidth*** or ***Restricted maximum bandwidth***. |
| Uplink Bandwidth | List uplink bandwidth |
| Download Bandwidth | List Download bandwidth |
| Comment | Definition of the setting |
| Select | Click to select rule for further action. |
| Delete Selected | Delete selected rules. |
| Delete All | Delete all rules listed on table. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

## Management - Statistics

This page shows the packet counters for transmission and reception regarding to wireless, Ethernet LAN and Ethernet WAN networks.

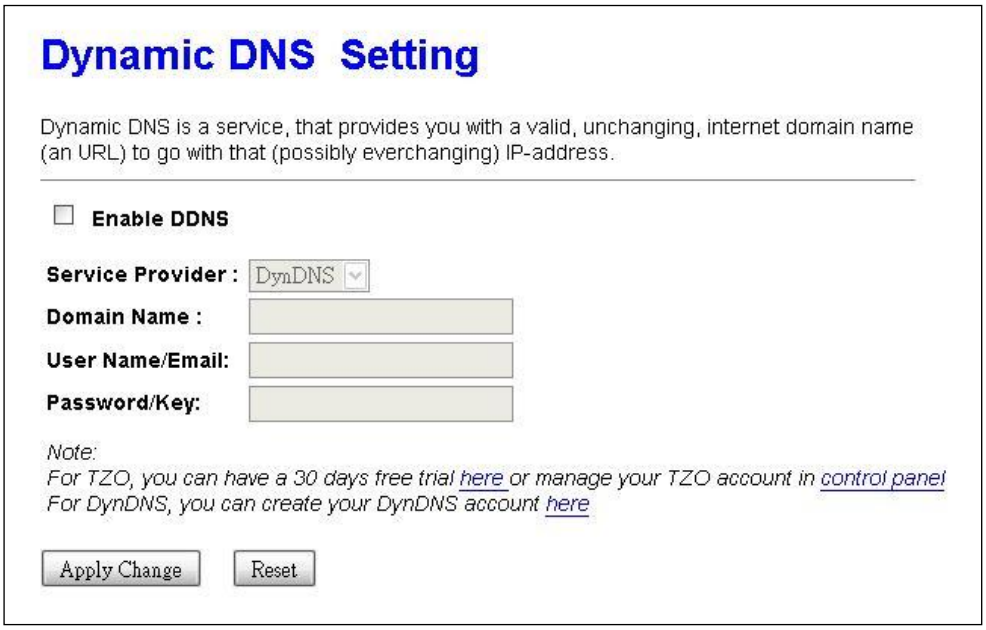



| Item | Description |
|---|---|
| Wireless LAN | |
| ***Sent Packets*** | It shows the statistic count of sent packets on the wireless LAN interface. |
| ***Received Packets*** | It shows the statistic count of received packets on the wireless LAN interface. |
| Ethernet LAN | |
| ***Sent Packets*** | It shows the statistic count of sent packets on the Ethernet LAN interface. |
| ***Received Packets*** | It shows the statistic count of received packets on the Ethernet LAN interface. |
| Ethernet WAN | |

| | |
|---|---|
| ***Sent Packets*** | It shows the statistic count of sent packets on the Ethernet WAN interface. |
| ***Received Packets*** | It shows the statistic count of received packets on the Ethernet WAN interface. |
| Refresh | Click the refresh the statistic counters on the screen. |

## Management - DDNS

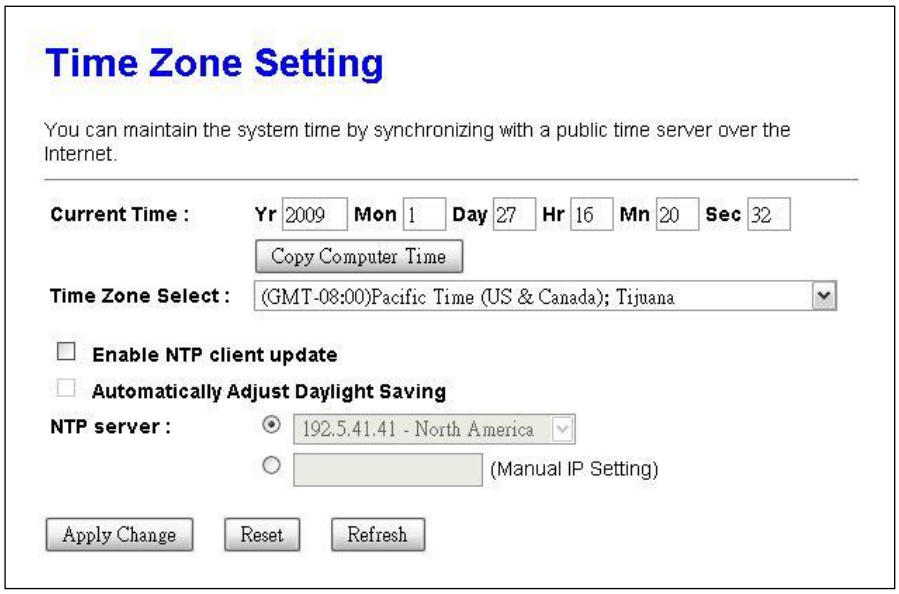
This page is used to configure Dynamic DNS service to have DNS with dynamic IP address.


Dynamic DNS Setting
Dynamic DNS is a service, that provides you with a valid, unchanging, internet domain name (an URL) to go with that (possibly everchanging) IP-address.
Enable DDNS
Service Provider :
DynDNS
Domain Name :
User Name/Email:
Password/Key:
Note:
For TZO, you can have a 30 days free trial here or manage your TZO account in control panel
For DynDNS, you can create your DynDNS account here
Apply Change
Reset

| Item | Description |
|---|---|
| Enable DDNS | Click the checkbox to enable *DDNS* service. |
| Service Provider | Click the drop down menu to pick up the right provider. |
| Domain Name | To configure Domain Name. |
| User Name/Email | Configure User Name, Email. |
| Password/Key | Configure Password, Key. |
| Apply Change | Click the ***Apply Changes*** button to save the enable DDNS service. |
| Reset | Click the ***Reset*** button to abort change and recover the previous configuration setting. |

# Management - Time Zone Setting

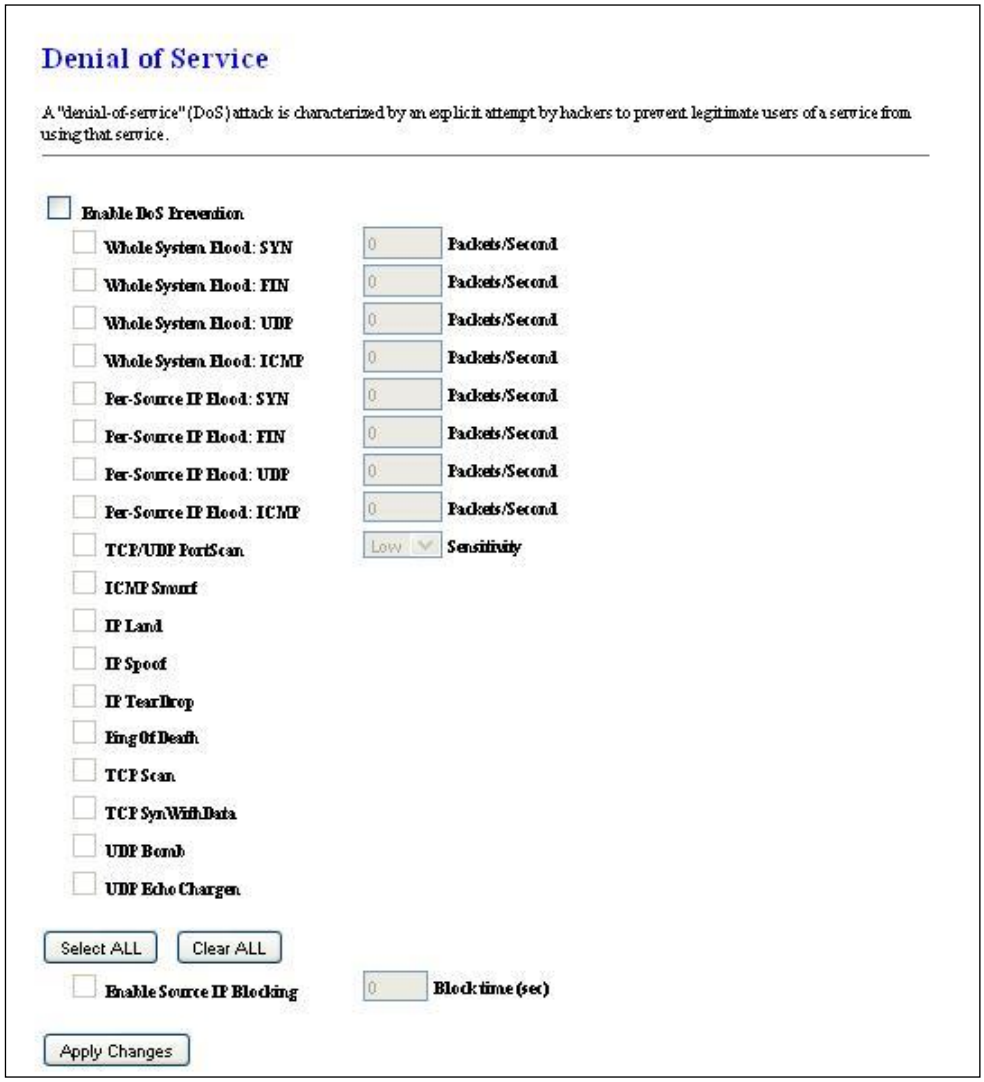
This page is used to configure NTP client to get current time.


Time Zone Setting
You can maintain the system time by synchronizing with a public time server over the Internet.
Current Time :
Yr 2009 Mon 1 Day 27 Hr 16 Mn 20 Sec 32
Copy Computer Time
Time Zone Select :
(GMT-08:00)Pacific Time (US & Canada); Tijuana
Enable NTP client update
Automatically Adjust Daylight Saving
NTP server :
192.5.41.41 - North America
(Manual IP Setting)
Apply Change
Reset
Refresh

| Item | Description |
|---|---|
| Current Time | It shows the current time. |
| Time Zone Select | Click the time zone in your country. |
| Enable NTP client update | Click the checkbox to enable NTP client update. R |
| NTP Server | Click select default or input NTP server IP address. |
| Apply Change | Click the *Apply Changes* button to save and enable NTP client service. |
| Reset | Click the *Reset* button to abort change and recover the previous configuration setting. |
| Refresh | Click the refresh the current time shown on the screen. |

# Management – Denial-of-Service

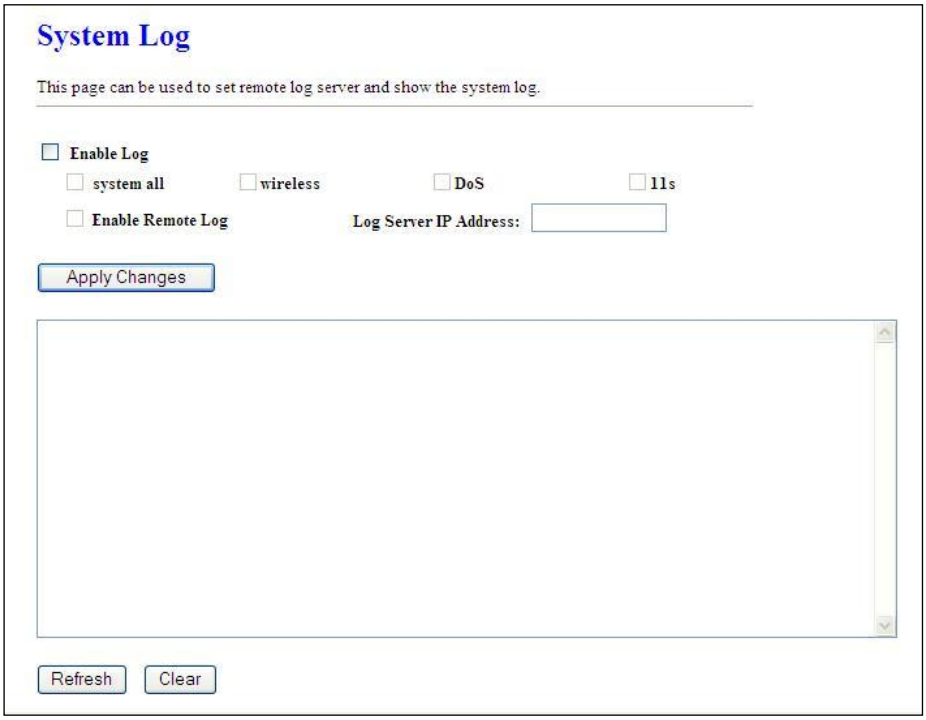
This page is used to enable and setup protection to prevent attack by hacker's program. It provides more security for users.




| Item | Description |
|---|---|
| Enable DoS Prevention | Click the checkbox to enable DoS prevention. |
| Whole System Flood/<br>Per-Source IP Flood | Enable and setup prevention in details. |
| Select ALL | Click the checkbox to enable all prevention items. |
| Clear ALL | Click the checkbox to disable all prevention items |
| Apply Changes | Click the *Apply Changes* button to save above settings. |

# Management - Log

This page is used to configure the remote log server and shown the current log.




| Item | Description |
|---|---|
| Enable Log | Click the checkbox to enable log. |
| ***System all*** | Show all log of wireless broadband router |
| ***Wireless*** | Only show wireless log |
| ***DoS*** | Only show Denial-of-Service log |
| ***Enable Remote Log*** | Click the checkbox to enable remote log service. |
| ***Log Server IP Address*** | Input the remote log IP address |
| Apply Changes | Click the ***Apply Changes*** button to save above settings. |
| Refresh | Click the refresh the log shown on the screen. |
| Clear | Clear log display screen |

# Management - Upgrade Firmware

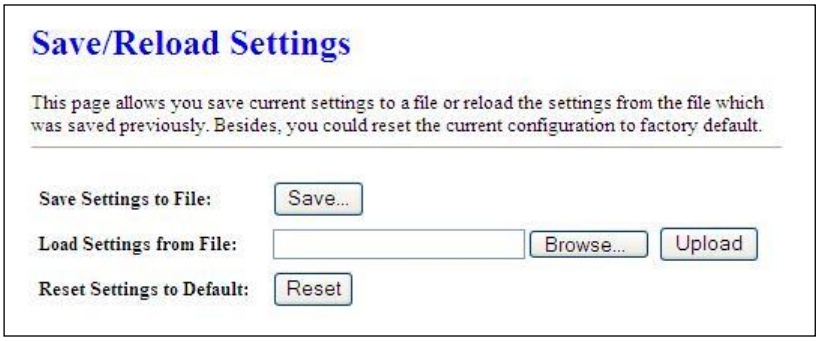
This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.

Upgrade Firmware
This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.
Select File:
Browse...
Upload
Reset

| Item | Description |
|---|---|
| Select File | Click the *Browse* button to select the new version of web firmware image file. |
| Upload | Click the *Upload* button to update the selected web firmware image to the WLAN Broadband Router. |
| Reset | Click the *Reset* button to abort change and recover the previous configuration setting. |

## Management Save/ Reload Settings

This page allows you save current settings to a file or reload the settings from the file that was saved previously. Besides, you could reset the current configuration to factory default.


Save/Reload Settings
This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.
Save Settings to File:
Save...
Load Settings from File:
Browse...
Upload
Reset Settings to Default:
Reset

| Item | Description |
|---|---|
| Save Settings to File | Click the ***Save*** button to download the configuration parameters to your personal computer. |
| Load Settings from File | Click the ***Browse*** button to select the configuration files then click the ***Upload*** button to update the selected configuration to the WLAN Broadband Router. |
| Reset Settings to Default | Click the ***Reset*** button to reset the configuration parameter to factory defaults. |

## Management - Password Setup

This page is used to set the account to access the web server of Access Point. Empty user name and password will disable the protection.

Password Setup
This page is used to set the account to access the web server of Access Point. Empty user name and password will disable the protection.
User Name:
New Password:
Confirmed Password:
Apply Changes
Reset

| Item | Description |
|---|---|
| User Name | Fill in the user name for web management login control. |
| New Password | Fill in the password for web management login control. |
| Confirmed Password | Because the password input is invisible, so please fill in the password again for confirmation purpose. |
| Apply Changes | Clear the *User Name* and *Password* fields to empty, means to apply no web management login control. Click |

| | |
|---|---|
| | the *Apply Changes* button to complete the new configuration setting. |
| Reset | Click the *Reset* button to abort change and recover the previous configuration setting. |

# Frequently Asked Questions (FAQ)

1. What and how to find my PC's IP and MAC address?

IP address is the identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 191.168.1.254 could be an IP address.

The MAC (Media Access Control) address is your computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address.) When you're connected to the Internet from your computer (or host as the Internet protocol thinks of it), a correspondence table relates your IP address to your computer's physical (MAC) address on the LAN.

To find your PC's IP and MAC address,

- Open the Command program in the Microsoft Windows.
- Type in ***ipconfig /all*** then press the ***Enter*** button.
- Your PC's IP address is the one entitled IP Address and your PC's MAC address is the one entitled Physical Address.

2. What is Wireless LAN?

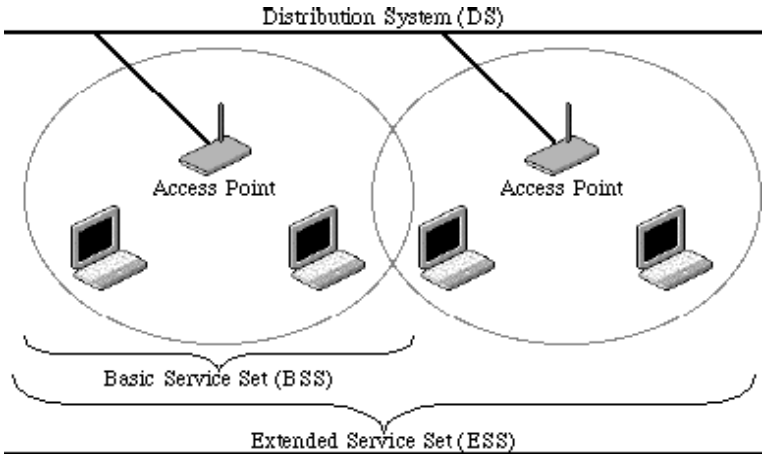
A wireless LAN (WLAN) is a network that allows access to Internet without the need for any wired connections to the user's machine

3. What are ISM bands?

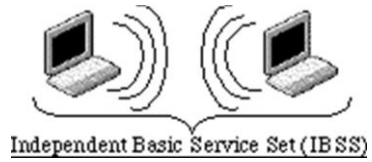
ISM stands for Industrial, Scientific and Medical; radio frequency bands that the Federal Communications Commission (FCC) authorized for wireless LANs. The ISM bands are located at 915 +/- 13 MHz, 2450 +/- 50 MHz and 5800 +/- 75 MHz.

4. How does wireless networking work?

The 802.11 standard define two modes: infrastructure mode and ad hoc mode. In infrastructure mode, the wireless network consists of at least one access point connected to the wired network infrastructure and a set of wireless end stations. This configuration is called a Basic Service Set (BSS). An Extended Service Set (ESS) is a set of two or more BSSs forming a single subnetwork. Since most corporate WLANs require access to the wired LAN for services (file servers, printers, Internet links) they will operate in infrastructure mode.




Ad hoc mode (also called peer-to-peer mode or an Independent Basic Service Set, or IBSS) is simply a set of 802.11 wireless stations that communicate directly with one another without using an access point or any connection to a wired network. This mode is useful for quickly and easily setting up a wireless network anywhere that a wireless infrastructure does not exist or is not required for services, such as a hotel room, convention center, or airport, or where access to the wired network is barred (such as for consultants at a client site).



Example 2: wireless Ad Hoc Mode

5. What is BSSID?

A six-byte address that distinguishes a particular access point from others. Also know as just SSID. Serves as a network ID or name.

6. What is ESSID?

The Extended Service Set ID (ESSID) is the name of the network you want to access. It is used to identify different wireless networks.

7. What are potential factors that may causes interference?

Factors of interference:

- Obstacles: walls, ceilings, furniture… etc.
- Building Materials: metal door, aluminum studs.
- Electrical devices: microwaves, monitors and electrical motors.

Solutions to overcome the interferences:

- Minimizing the number of walls and ceilings.
- Position the WLAN antenna for best reception.
- Keep WLAN devices away from other electrical devices, eg: microwaves, monitors, electric motors … etc.

□ Add additional WLAN Access Points if necessary.

8. What are the Open System and Shared Key authentications?

IEEE 802.11 supports two subtypes of network authentication services: open system and shared key. Under open system authentication, any wireless station can request authentication. The station that needs to authenticate with another wireless station sends an authentication management frame that contains the identity of the sending station.

The receiving station then returns a frame that indicates whether it recognizes the sending station. Under shared key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from the 802.11 wireless network communications channel.

9. What is WEP?

An optional IEEE 802.11 function that offers frame transmission privacy similar to a wired network. The Wired Equivalent Privacy generates secret shared encryption keys that both source and destination stations can use to alert frame bits to avoid disclosure to eavesdroppers.

WEP relies on a secret key that is shared between a mobile station (e.g. a laptop with a wireless Ethernet card) and an access point (i.e. a base station). The secret key is used to encrypt packets before they are transmitted, and an integrity check is used to ensure that packets are not modified in transit.

10. What is Fragment Threshold?

The proposed protocol uses the frame fragmentation mechanism defined in IEEE 802.11 to achieve parallel transmissions. A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes. The determination of an efficient fragment threshold is an important issue in this scheme. If the fragment threshold is small, the overlap part of the master and parallel transmissions is large. This means the spatial reuse ratio of parallel transmissions is high. In contrast, with a large fragment threshold, the overlap is small and the spatial reuse ratio is low. However high fragment threshold leads to low fragment overhead. Hence there is a trade-off between spatial re-use and fragment overhead.

Fragment threshold is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented.

If you find that your corrupted packets or asymmetric packet reception (all send packets, for example). You may want to try lowering your fragmentation threshold. This will cause packets to be broken into smaller fragments. These small fragments, if corrupted, can be resent faster than a larger fragment. Fragmentation increases overhead, so you'll want to keep this value as close to the maximum value as possible.

11. What is RTS (Request To Send) Threshold?

The RTS threshold is the packet size at which packet transmission is governed by the RTS/CTS transaction. The IEEE 802.11-1997 standard allows for short packets to be transmitted without RTS/CTS transactions. Each station can have a different RTS threshold. RTS/CTS is used when the data packet size exceeds the defined RTS threshold. With the CSMA/CA transmission mechanism, the transmitting station sends out an RTS packet to the receiving station, and waits for the receiving station to send ack a CTS (Clear to Send) packet before sending the actual packet data.
This setting is useful for networks with many clients. With many clients, and a high network load, there will be many more collisions. By lowering the RTS threshold, there may be fewer collisions, and performance should improve. Basically, with a faster RTS threshold, the system can recover from problems faster. RTS packets consume valuable bandwidth, however, so setting this value too low will limit performance.

12. What is Beacon Interval?

In addition to data frames that carry information from higher layers, 802.11 include management and control frames that support data transfer. The beacon frame, which is a type of management frame, provides the "heartbeat" of a wireless LAN, enabling stations to establish and maintain communications in an orderly fashion.
Beacon Interval represents the amount of time between beacon transmissions. Before a station enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).

13. What is Preamble Type?

There are two preamble types defined in IEEE 802.11 specification. A long preamble basically gives the decoder more time to process the preamble. All 802.11 devices support a long preamble. The short preamble is designed to improve efficiency (for example, for VoIP systems). The difference between the two is in the Synchronization field. The long preamble is 128 bits, and the short is 56 bits.

14. What is SSID Broadcast?

Broadcast of SSID is done in access points by the beacon. This announces your access point (including various bits of information about it) to the wireless world around it. By disabling that feature, the SSID configured in the client must match the SSID of the access point.
Some wireless devices don't work properly if SSID isn't broadcast (for example the D-link DWL-120 USB 802.11b adapter). Generally if your client hardware supports operation with SSID disabled, it's not a bad idea to run that way to enhance network security. However it's no replacement for WEP, MAC filtering or other protections.

15. What is Wi-Fi Protected Access (WPA)?

Wi-Fi's original security mechanism, Wired Equivalent Privacy (WEP), has been viewed as insufficient for securing confidential business communications. A longer-term solution, the IEEE 802.11i standard, is under development. However, since the IEEE 802.11i standard is not expected to be published until the end of 2003, several members of the WI-Fi Alliance teamed up with members of the IEEE 802.11i task group to develop a significant near-term enhancement to Wi-Fi security. Together, this team developed Wi-Fi Protected Access. To upgrade a WLAN network to support WPA, Access Points will require a WPA software upgrade. Clients will require a software upgrade for the network interface card, and possibly a software update for the operating system. For enterprise networks, an authentication server, typically one that supports RADIUS and the selected EAP authentication protocol, will be added to the network.

16. What is WPA2?

It is the second generation of WPA. WPA2 is based on the final IEEE 802.11i amendment to the 802.11 standard.

17. What is 802.1x Authentication?

802.1x is a framework for authenticated MAC-level access control, defines Extensible Authentication Protocol (EAP) over LANs (WAPOL). The standard encapsulates and leverages much of EAP, which was defined for dial-up authentication with Point-to-Point Protocol in RFC 2284.
Beyond encapsulating EAP packets, the 802.1x standard also defines EAPOL messages that convey the shared key information critical for wireless security.

18. What is Temporal Key Integrity Protocol (TKIP)?

The Temporal Key Integrity Protocol, pronounced tee-kip, is part of the IEEE 802.11i encryption standard for wireless LANs. TKIP is the next generation of WEP, the Wired Equivalency Protocol, which is used to secure 802.11 wireless LANs. TKIP provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus fixing the flaws of WEP.

19. What is Advanced Encryption Standard (AES)?

Security issues are a major concern for wireless LANs, AES is the U.S. government's next-generation cryptography algorithm, which will replace DES and 3DES.

20. What is Inter-Access Point Protocol (IAPP)?

The IEEE 802.11f Inter-Access Point Protocol (IAPP) supports Access Point Vendor interoperability, enabling roaming of 802.11 Stations within IP subnet.
IAPP defines messages and data to be exchanged between Access Points and between the IAPP and high layer management entities to support roaming. The IAPP protocol uses TCP for inter-Access Point communication and UDP for RADIUS request/response exchanges. It also uses Layer 2 frames

to update the forwarding tables of Layer 2 devices.

21. What is Wireless Distribution System (WDS)?

The Wireless Distribution System feature allows WLAN AP to talk directly to other APs via wireless channel, like the wireless bridge or repeater service.

22. What is Universal Plug and Play (uPNP)?

UPnP is an open networking architecture that consists of services, devices, and control points. The ultimate goal is to allow data communication among all UPnP devices regardless of media, operating system, programming language, and wired/wireless connection.

23. What is Maximum Transmission Unit (MTU) Size?

Maximum Transmission Unit (MTU) indicates the network stack of any packet is larger than this value will be fragmented before the transmission. During the PPP negotiation, the peer of the PPP connection will indicate its MRU and will be accepted. The actual MTU of the PPP connection will be set to the smaller one of MTU and the peer's MRU. The default is value 1400.

24. What is Clone MAC Address?

Clone MAC address is designed for your special application that request the clients to register to a server machine with one identified MAC address.

Since that all the clients will communicate outside world through the WLAN Broadband Router, so have the cloned MAC address set on the WLAN Broadband Router will solve the issue.

25. What is DDNS?

DDNS is the abbreviation of Dynamic Domain Name Server. It is designed for user own the DNS server with dynamic WAN IP address.

26. What is NTP Client?

NTP client is designed for fetching the current timestamp from internet via Network Time protocol. User can specify time zone, NTP server IP address.

27. What is VPN?

VPN is the abbreviation of Virtual Private Network. It is designed for creating point-to point private link via shared or public network.

28. What is IPSEC?

IPSEC is the abbreviation of IP Security. It is used to transferring data securely under VPN.